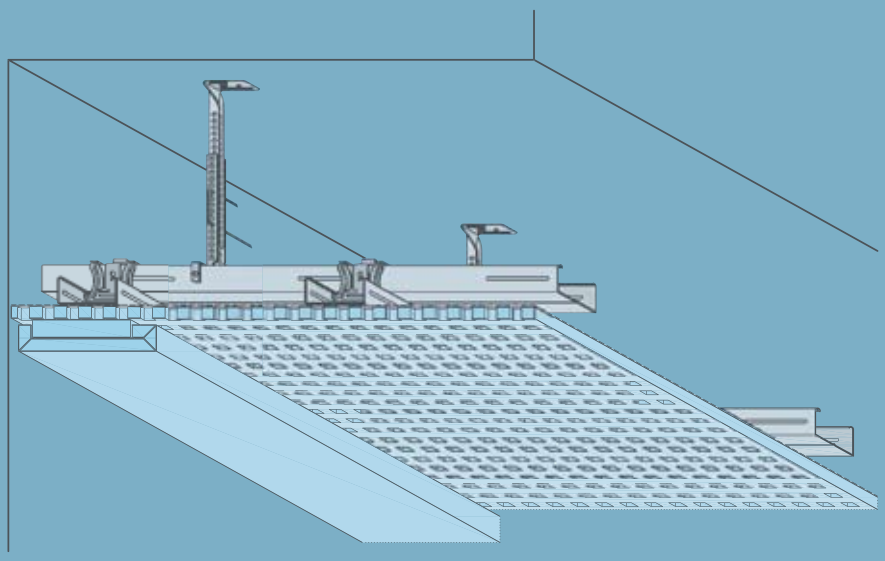
KNAUF
Drywall Systems



D12

Technical Data Sheet | 2008-08

# D12 **Knauf Cleaneo Acoustic** Ceilings

D127 – Knauf Cleaneo Acoustic Design Ceiling

D124 – Knauf Cleaneo Acoustic Fire Protection Ceiling

The structural, statical properties, and characteristic building physics of Knauf systems can solely be ensured with the exclusive use of Knauf system components, or other products expressly recommended by Knauf.

# D12 Knauf Cleaneo Acoustic Ceilings

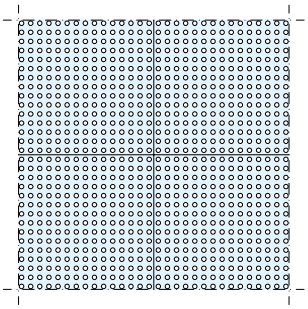
**Perforation Design: Continuous Perforation / Block Slots “slotline”**

## Continuous perforation

scheme drawings, face side

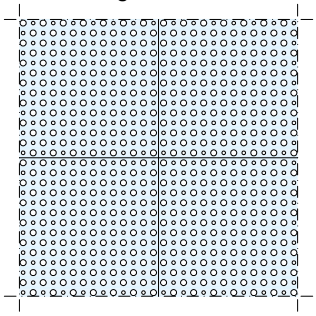
| Design | Perforation | Perforation ratio (board) % | Board dimensions (standard size) width mm | Board dimensions (standard size) length mm | Spacing of furring channel b mm | Edge type 4SK |
|---|---|---|---|---|---|---|
| Standard Circular R | 6/18 R | 8.7 | 1188 | 1998 | 333 | ● |
| | 8/18 R | 15.5 | 1188 | 1998 | 333 | ● |
| | 10/23 R | 14.8 | 1196 | 2001 | 333.5 | ● |
| | 12/25 R | 18.1 | 1200 | 2000 | 333.3 | ● |
| | 15/30 R | 19.6 | 1200 | 1980 | 330 | ● |
| Alternating Circular R | 8/12/50 R | 13.1 | 1200 | 2000 | 333.3 | ● |
| | 12/20/66 R | 19.6 | 1188 | 1980 | 330 | ● |
| Standard Square Q | 8/18 Q | 19.8 | 1188 | 1998 | 333 | ● |
| | 12/25 Q | 23.0 | 1200 | 2000 | 333.3 | ● |
| Random PLUS R | 8/15/20 R | 9.9 | 1200 | 1875 oder 2500 | 312.5 | ● |
| | 12/20/35 R | 9.8 | 1200 | | 312.5 | ● |

**Standard Circular R**



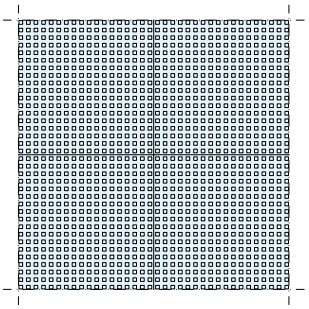
example: 15/30 R

**Alternating Circular R**



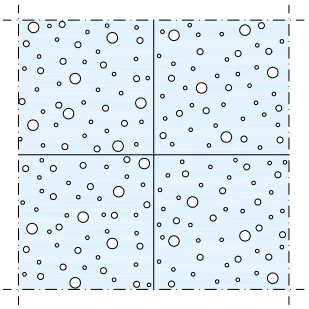
example: 12/20/66 R

**Standard Square Q**



example: 12/25 Q

**Random PLUS R**



example: 12/20/35 R

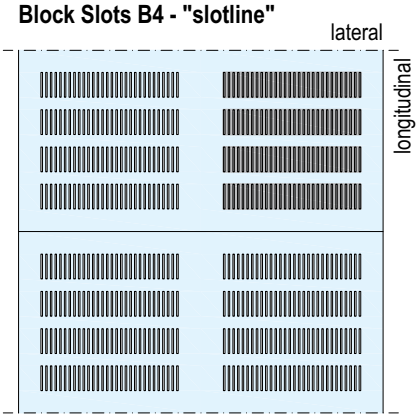
## Block Slots "slotline"

Perimeter dimensions are optical specifications (see page 4)

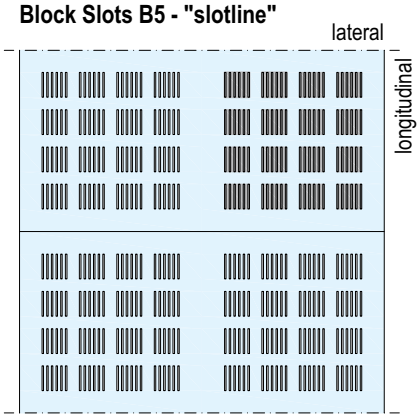
scheme drawings, face side

| Design | Slots per "block" lateral | Slots per "block" longitudinal | Perimeter non-slotted lateral mm | Perimeter non-slotted longitud. mm | Slot ratio (board) % | Board dimensions (standard size) width mm | Board dimensions (standard size) length mm | Spacing of furring channel b mm | Edge type HRK SFK | Edge type 4SK | Edge type 4AK |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B4 - "slotline" | 30 | 4 | 73.9 | 73.3 | 13.7 | 1200 | 2400 | 300 | ● | ● | ● |
| B5 - "slotline" | 4x 6 | 4 | 73.9 | 73.3 | 10.9 | 1200 | 2400 | 300 | ● | ● | ● |
| B6 - "slotline" | 69 | 4 | 73.9 | 73.3 | 15.7 | 1200 | 2400 | 300 | ● | ● | ● |

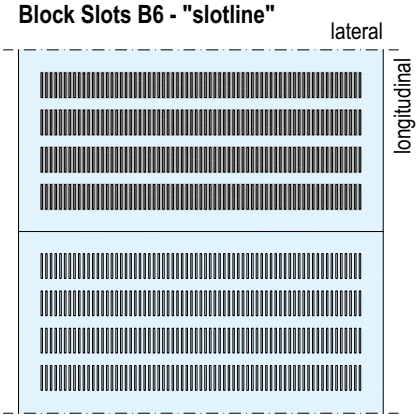
**Block Slots B4 - "slotline"**




**Block Slots B5 - "slotline"**




**Block Slots B6 - "slotline"**




- Slots are only possible in longitudinal direction of Knauf Cleaneo Acoustic Boards

**Note** Regard further information and data on pages 3 + 4

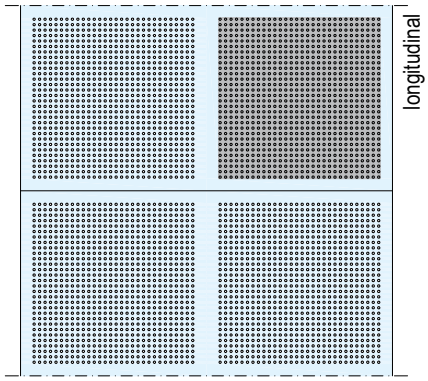
# D12 Knauf Cleaneo Acoustic Ceilings

**Perforation Design: Block Perforation / Types of Knauf Cleaneo Acoustic Boards**

**Block perforation** Perimeter dimensions are optical specifications (see page 4) — scheme drawings, face side

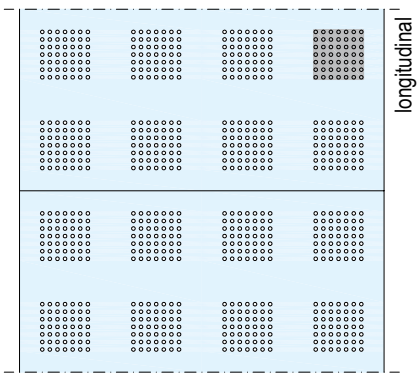
| Design | Perforation | Perforations per "block" lateral | Perforations per "block" longitudinal | Perimeter non-perforated lateral mm | Perimeter non-perforated longitud. mm | Perforation ratio (board) % | Board dimensions (standard size) width mm | Board dimensions (standard size) length mm | Spacing of furring channels b mm | Edge type 4SK | Edge type 4AK |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B4 | 8/18 R | 30 | 30 | 41 | 41 | 12.1 | 1224 | 2448 | 312.5 | ● | - |
| | 12/25 R | 19 | 19 | 69 | 69 | 11.3 | 1200 | 2400 | 300 | ● | ● |
| | 12/25 Q | 19 | 19 | 69 | 69 | 14.4 | 1200 | 2400 | 300 | ● | ● |
| B5 | 8/18 R | 13 | 13 | 41 | 41 | 9.1 | 1224 | 2448 | 312.5 | ● | - |
| | 12/25 R | 7 | 7 | 69 | 69 | 6.2 | 1200 | 2400 | 300 | ● | ● |
| | 12/25 Q | 7 | 7 | 69 | 69 | 7.8 | 1200 | 2400 | 300 | ● | ● |
| B6 | 8/18 R | 64 | 30 | 41 | 41 | 12.9 | 1224 | 2448 | 312.5 | ● | - |
| | 12/25 R | 43 | 19 | 69 | 69 | 12.8 | 1200 | 2400 | 300 | ● | ● |
| | 12/25 Q | 43 | 19 | 69 | 69 | 16.3 | 1200 | 2400 | 300 | ● | ● |

**Block Perforation B4**



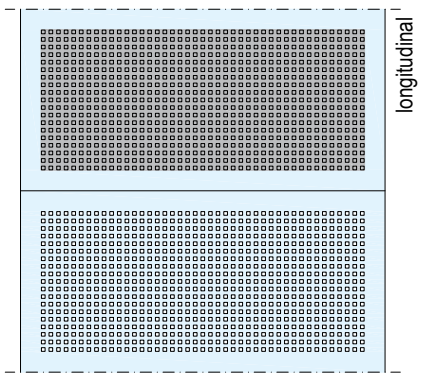

example: 8/18 R

**Block Perforation B5**




example: 12/25 R

**Block Perforation B6**

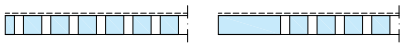



example: 12/25 Q

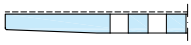
## Edge types

scheme drawings

**4SK** 4-side square edge



**4AK** 4-side tapered edge



**SFK** front edge, beveled

**HRK** long edge: half-rounded

**Standard:**

| | |
|---|---|
| Continuous perforation: | 4SK |
| Block slots: | HRK / SFK |
| Block perforation: | 4SK |

## Board types

- **Knauf Cleaneo Acoustic**
  are perforated or slotted gypsum boards with air-cleaning effect due to addition of Zeolite
  (see also Knauf Technical Data Sheet K761)

  **Cleaneo Acoustic Boards 12.5 mm incl. Knauf Standard Fleece on back**
  (black or white)

- **Acoustic Plaster Base Board**
  Knauf Cleaneo Acoustic Board, 12.5 mm with
  - Special plaster base paper covering on face side
  - Face side fleece (laminated waterproof)
  - Optional: PE foil lamination on back

  Standard type:
  Perforation: 12/20/66 R
  Board dimensions: 1250 x 2000 mm
  Edge: HRAK / SFK

Application of plaster coat according to the instructions provided by the plaster manufacturer

## Block Slots + Block Perforations

Boards should be of a single production line. Therefore customized boards (e.g. according to installation plan) cannot be combined with boards produced to standard specifications

## Spacings of furring channels b

**Spacings of furring channels regard only to standard board dimensions**
For customized production (e.g. according to installation plan) spacings should be adjusted to the special board dimensions
(regard maximum allowable spacings)

## Molded boards

Knauf Cleaneo Acoustic Boards can be bent dry in longitudinal direction

Bending radii on request

**Notes**

Other types respectively customized design of Knauf Cleaneo Acoustic Boards on request
For perforation patterns of all board designs see pages 6 to 13

# D12 Knauf Cleaneo Acoustic Ceilings

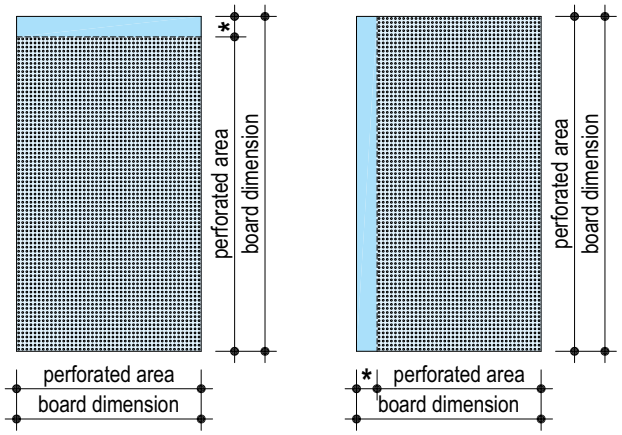
**Perforation Design: Non-perforated Perimeter**

## Non-perforated perimeter

scheme drawings, face side **Production related specifications**

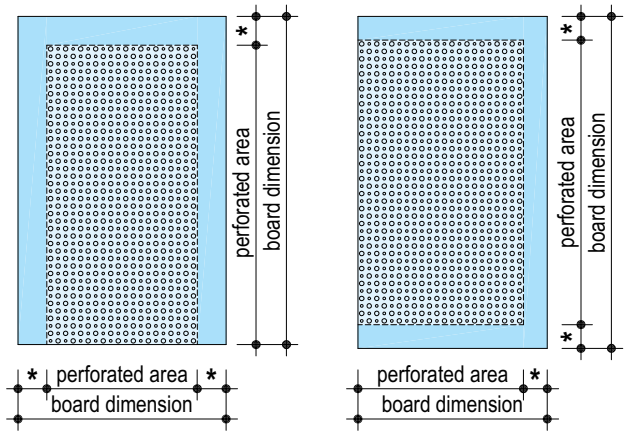
### 1- sided non-perforated perimeter

example: 8/18 R



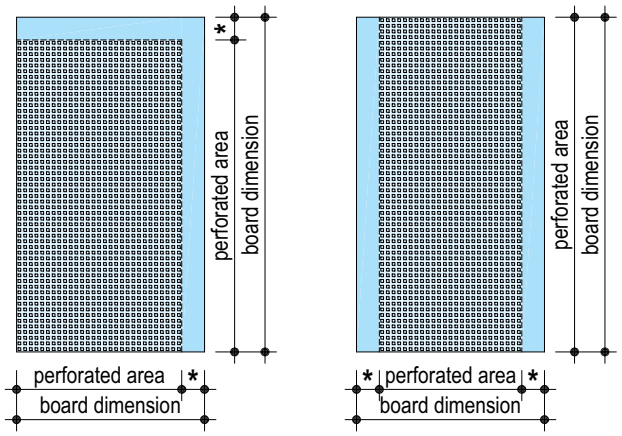

### 3- sided non-perforated perimeter

example: 12/20/66 R



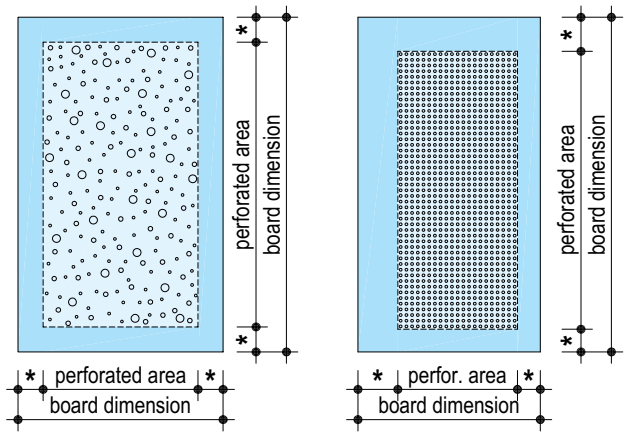

### 2- sided non-perforated perimeter

example: 12/25 Q




### 4- sided non-perforated perimeter

examples: 12/20/35 R and 12/25 R



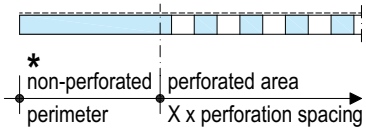

**Production related specifications**

scheme drawings, example: 15/30 R

### Edge types

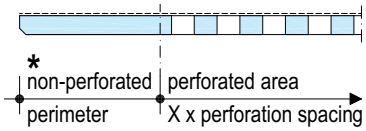
scheme drawings

**4SK** 4-side square edge



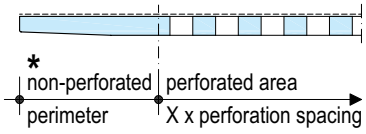

- **all perimeter types**

**FK** 45° beveled edge (factory made)




- **non-perforated perimeter**

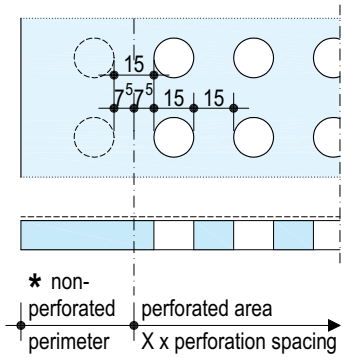
**4AK** 4-side tapered edge



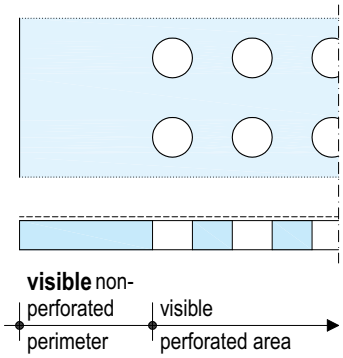

- **4-side non-perforated perimeter ≥ 69 mm**
- **board dimension: 1200 x 2400 mm**

### Specs for non-perforated perimeters

- **production related specification**




- **optical specification**




Boards should be from a single board line. Therefore customized boards, viz according to installation plan, or boards with non-perforated perimeter cannot be combined with boards produced acc. to standard specifications.

**Notes**

* = non-perforated perimeter, possible 1-side to 4-side

Regard further information on pages 2 and 3

# D12 Knauf Cleaneo Acoustic Ceilings

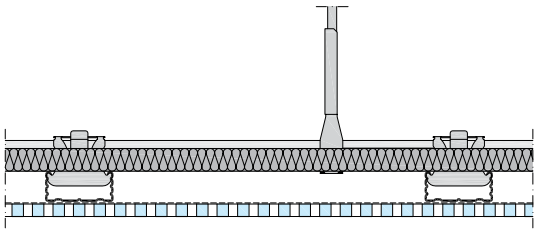
**Sound Absorption, Material / Definition of Terms**

## Material

- **Cladding:** Knauf Cleaneo Acoustic Board, 12.5 mm thick with laminated back side fleece (Standard Fleece)
- **Insulation:**
  - D127: Mineral wool acc. to DIN EN 13162, 20 mm thick; length related flow resistance value according to DIN EN 29053: r ≥ 10 kPa · s/m²
  - D124: Mineral wool, see page 21

## Insulation layer

scheme drawing D127



- Apply acoustically effective mineral wool above furring channels

## Notes

All sound absorption coefficients stated on pages 6 to 15 are only valid for boards with factory-laminated Knauf Standard Fleece and the respective plenum height;

e.g. plenum height 200 mm = measurement according to DIN EN ISO 354 type E = E-200;

Values for other plenum heights on request

## Sound absorption classes

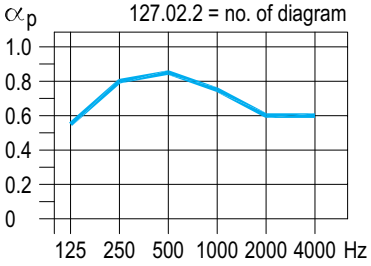
according to DIN EN ISO 11654; rated according to VDI 3755

| Rated sound absorption coefficient $\alpha_w$ | Sound absorption class | Rating |
|---|---|---|
| ≥ 0.9 | A | most absorbent |
| 0.8 and 0.85 | B | most absorbent |
| 0.6 to 0.75 | C | highly absorbent |
| 0.3 to 0.55 | D | absorbent |
| 0.15 to 0.25 | E | low absorbent |
| ≤ 0.1 | F *) | reflecting |

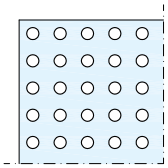
*) according to DIN EN ISO 11654 rated as "non-classified"

## Sound absorption, example

**Standard Circular 8/18 R** • with Standard Fleece + mineral wool




perforation rate: **15.5 %**



**plenum height 200 mm**

| $\alpha_p$ | 0.55 | 0.8 | 0.85 | 0.75 | 0.6 | 0.6 |
|---|---|---|---|---|---|---|

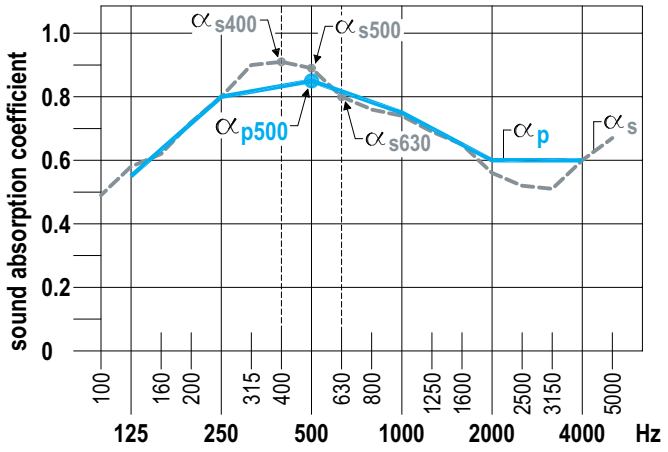
$\alpha_w$ = 0.70 (L) class: **C** (highly absorbent)

## Definitions of terms regarding absorption

$\alpha_s$ = **Sound absorption coefficient for third octave band width**
frequency-dependent value of sound absorption coefficient measured in third octave bands, according to DIN EN ISO 354

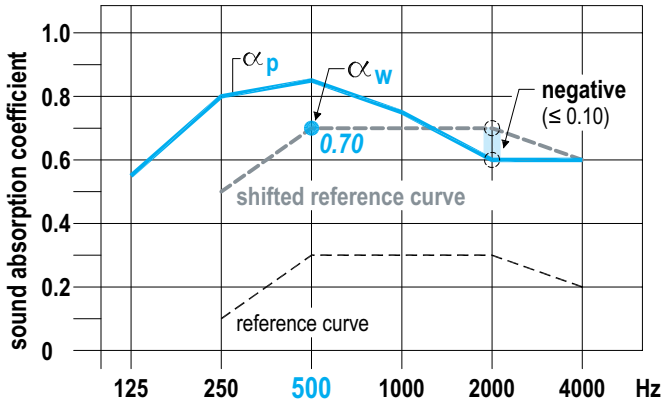
$\alpha_p$ = **practical sound absorption coefficient**
from $\alpha_s$ on octave bands converted according to DIN EN ISO 11654

*example for 500 Hz:* $\alpha_{p500} = \frac{\alpha_{s400} + \alpha_{s500} + \alpha_{s630}}{3}$




$\alpha_w$ = **rated sound absorption coefficient**
according to DIN EN ISO 11654
= **frequency-dependent single number parameter of sound** absorption coefficient determined from shifted reference curve (negative deviation ≤ 0.10) and point of intersection at **500 Hz** according to DIN EN ISO 11654

*example:*

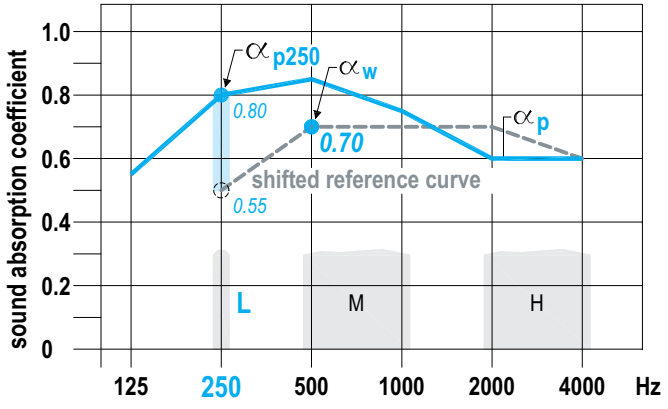



$\alpha_w$ **with layout indicators** = $\alpha_w$ (...)

If $\alpha_p$ exceeds the reference curve for a single octave frequency for **≥ 0.25** then add:

**(L)** at 250 Hz **(M)** at 500 or 1000 Hz **(H)** at 2000 or 4000 Hz

*example (250 Hz): 0.80 - 0.55 = 0.25 (≥ 0.25) = (L)* → $\alpha_w$ = 0.70 (L)



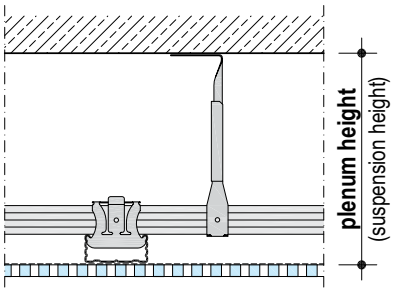
# D127 Knauf Cleaneo Acoustic Design Ceiling

**Sound Absorption, Ceiling Construction / Continuous Perforation**

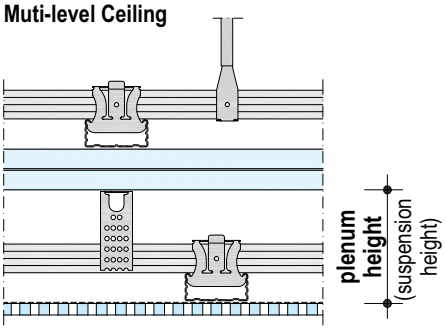
## Ceiling construction for systems D127 Cleaneo Acoustic Design Ceiling / Multi-level Ceiling

scheme drawings

D127




Muti-level Ceiling



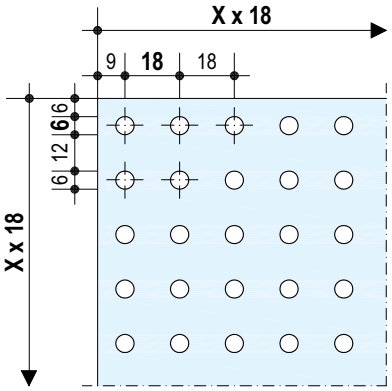

**Note:**

- The suspension height of the ceiling resp. plenum height (clearance) between Knauf Cleaneo Acoustic cladding and basic ceiling (D127) or between Cleaneo Acoustic cladding and gypsum board cladding of the fire protection level (Multi-level Ceiling) is a crucial parameter of acoustical efficiency.
- Increased plenum heights improve sound absorption coefficients of low frequencies. At the same time higher efficiency can be achieved in a wider frequency spectrum.

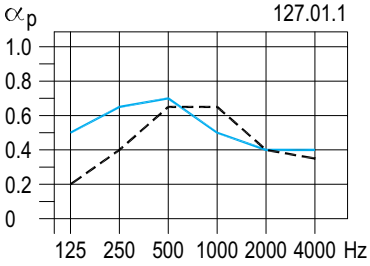
## Continuous perforation

### Standard Circular 6/18 R

Perforation ratio: **8.7 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.2 | 0.4 | 0.65 | 0.65 | 0.4 | 0.35 |
|---|---|---|---|---|---|---|

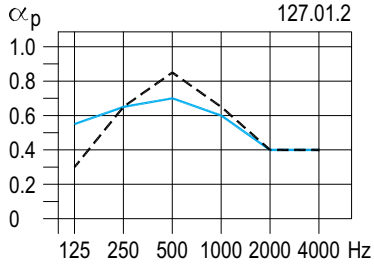
$\alpha_w$ = **0.45** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.5 | 0.65 | 0.7 | 0.5 | 0.4 | 0.4 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.50 (L)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.3 | 0.65 | 0.85 | 0.65 | 0.4 | 0.4 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.50 (LM)** class: **D** (absorbent)

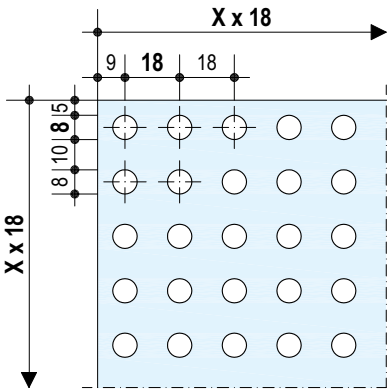
**plenum height 200 mm**

| $\alpha_p$ | 0.55 | 0.65 | 0.7 | 0.6 | 0.4 | 0.4 |
|---|---|---|---|---|---|---|

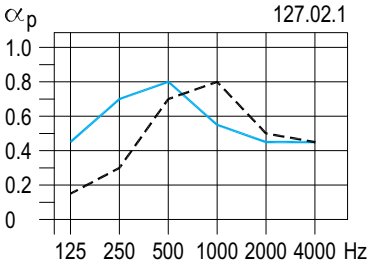
$\alpha_w$ = **0.50 (L)** class: **D** (absorbent)

### Standard Circular 8/18 R

Perforation ratio: **15.5 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.15 | 0.3 | 0.7 | 0.8 | 0.5 | 0.45 |
|---|---|---|---|---|---|---|

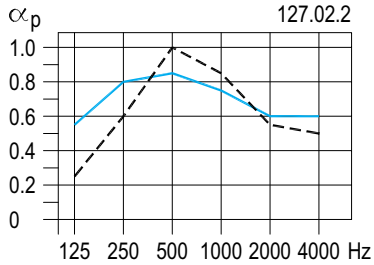
$\alpha_w$ = **0.55 (M)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.45 | 0.7 | 0.8 | 0.55 | 0.45 | 0.45 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.55 (LM)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.25 | 0.6 | 1 | 0.85 | 0.55 | 0.5 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.60 (M)** class: **C** (highly absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.55 | 0.8 | 0.85 | 0.75 | 0.6 | 0.6 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.70 (L)** class: **C** (highly absorbent)

scheme drawings, face side



**Note** Regard comment on page 5

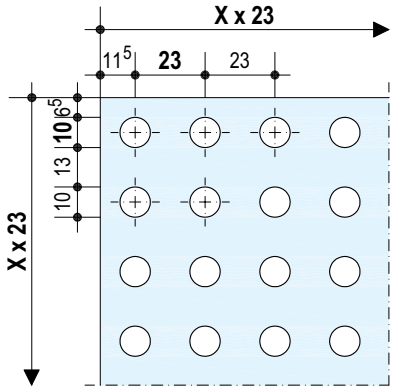
**Proof** Knauf Sound Insulation Proof: A 001-05.05

# D127 Knauf Cleaneo Acoustic Design Ceiling

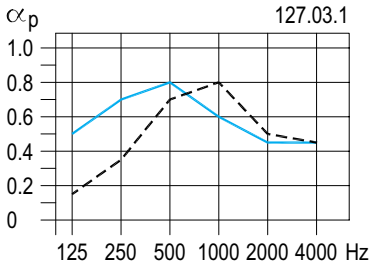
**Sound Absorption, Continuous Perforation**

## Standard Circular 10/23 R

Perforation ratio: **14.8 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.15 | 0.35 | 0.7 | 0.8 | 0.5 | 0.45 |
|---|---|---|---|---|---|---|

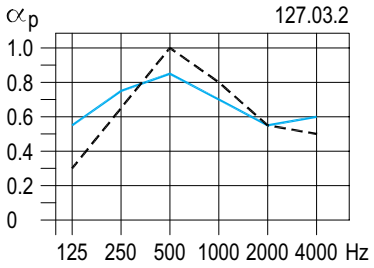
$\alpha_w$ = **0.55 (M)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.5 | 0.7 | 0.8 | 0.6 | 0.45 | 0.45 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.55 (LM)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.3 | 0.65 | 1 | 0.8 | 0.55 | 0.5 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.60 (LM)** class: **C** (highly absorbent)

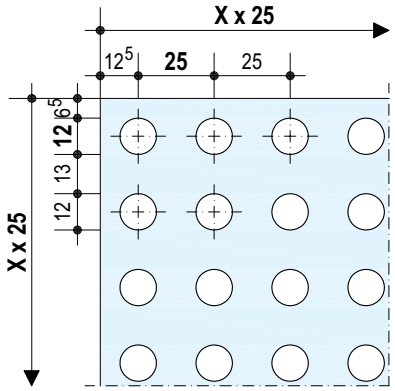
**plenum height 200 mm**

| $\alpha_p$ | 0.55 | 0.75 | 0.85 | 0.7 | 0.55 | 0.6 |
|---|---|---|---|---|---|---|

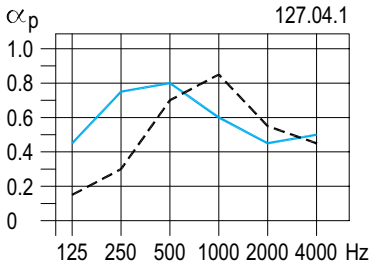
$\alpha_w$ = **0.65 (L)** class: **C** (highly absorbent)

## Standard Circular 12/25 R

Perforation ratio: **18.1 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.15 | 0.3 | 0.7 | 0.85 | 0.55 | 0.45 |
|---|---|---|---|---|---|---|

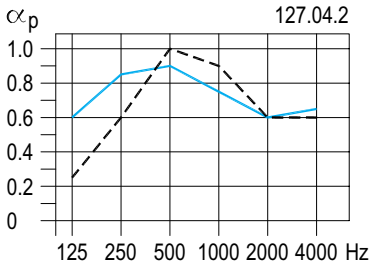
$\alpha_w$ = **0.55 (M)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.45 | 0.75 | 0.8 | 0.6 | 0.45 | 0.5 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.55 (LM)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.25 | 0.6 | 1 | 0.9 | 0.6 | 0.6 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.70 (M)** class: **C** (highly absorbent)

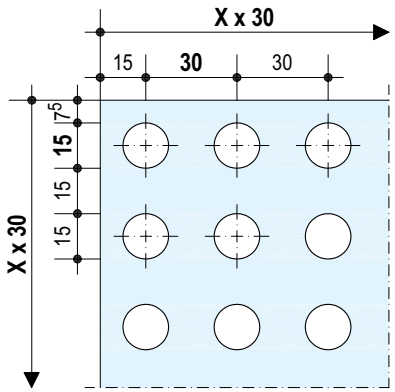
**plenum height 200 mm**

| $\alpha_p$ | 0.6 | 0.85 | 0.9 | 0.75 | 0.6 | 0.65 |
|---|---|---|---|---|---|---|

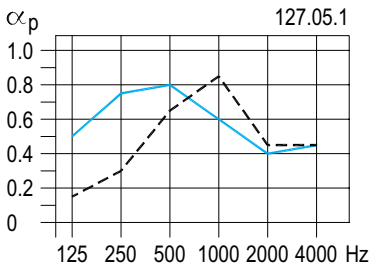
$\alpha_w$ = **0.70 (L)** class: **C** (highly absorbent)

## Standard Circular 15/30 R

Perforation ratio: **19.6 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.15 | 0.3 | 0.65 | 0.85 | 0.45 | 0.45 |
|---|---|---|---|---|---|---|

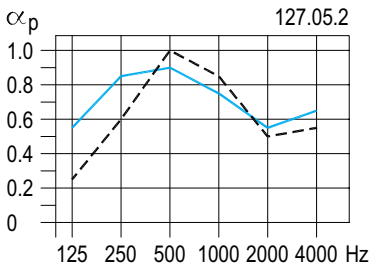
$\alpha_w$ = **0.50 (M)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.5 | 0.75 | 0.8 | 0.6 | 0.4 | 0.45 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.50 (LM)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.25 | 0.6 | 1 | 0.85 | 0.5 | 0.55 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.60 (M)** class: **C** (highly absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.55 | 0.85 | 0.9 | 0.75 | 0.55 | 0.65 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.65 (LM)** class: **C** (highly absorbent)

scheme drawings, face side

| **Note** | Regard comment on page 5 |
|---|---|

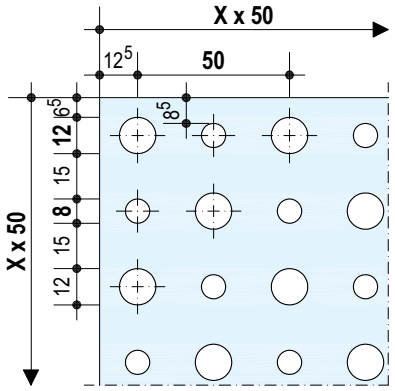
| **Proof** | Knauf Sound Insulation Proof: A 001-05.05 |
|---|---|

# D127 Knauf Cleaneo Acoustic Design Ceiling

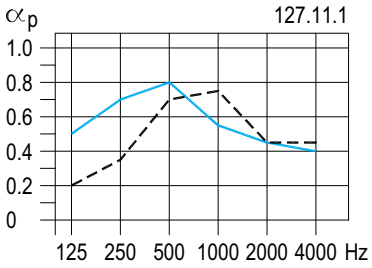
**Sound Absorption, Continuous Perforation**

## Alternating Circular 8/12/50 R

Perforation ratio: **13.1 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.2 | 0.35 | 0.7 | 0.75 | 0.45 | 0.45 |
|---|---|---|---|---|---|---|

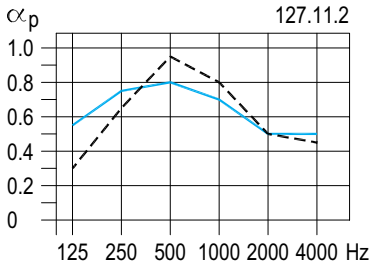
$\alpha_w$ = **0.55** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.5 | 0.7 | 0.8 | 0.55 | 0.45 | 0.4 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.50 (LM)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.3 | 0.65 | 0.95 | 0.8 | 0.5 | 0.45 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.55 (LM)** class: **D** (absorbent)

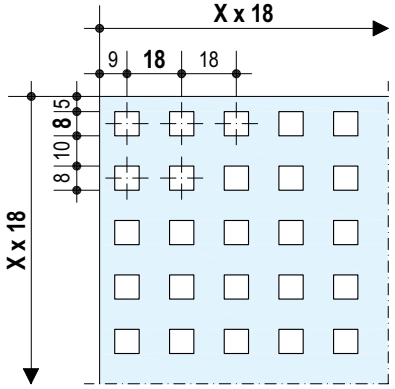
**plenum height 200 mm**

| $\alpha_p$ | 0.55 | 0.75 | 0.8 | 0.7 | 0.5 | 0.5 |
|---|---|---|---|---|---|---|

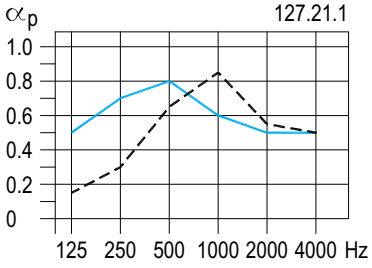
$\alpha_w$ = **0.60 (L)** class: **C** (highly absorbent)

## Standard Square 8/18 Q

Perforation ratio: **19.8 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.15 | 0.3 | 0.65 | 0.85 | 0.55 | 0.5 |
|---|---|---|---|---|---|---|

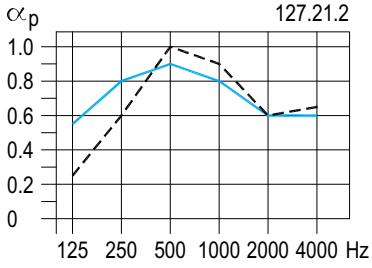
$\alpha_w$ = **0.55 (M)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.5 | 0.7 | 0.8 | 0.6 | 0.5 | 0.5 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.60 (L)** class: **C** (highly absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.25 | 0.6 | 1 | 0.9 | 0.6 | 0.65 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.70 (M)** class: **C** (highly absorbent)

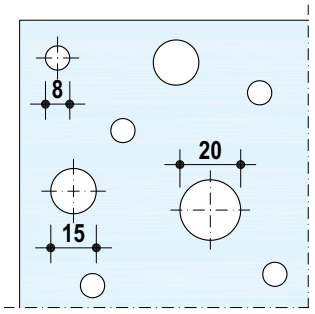
**plenum height 200 mm**

| $\alpha_p$ | 0.55 | 0.8 | 0.9 | 0.8 | 0.6 | 0.6 |
|---|---|---|---|---|---|---|

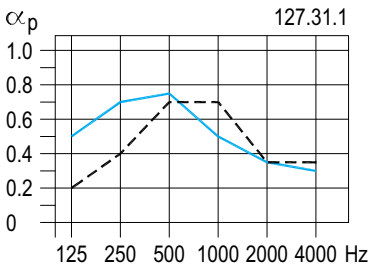
$\alpha_w$ = **0.70 (L)** class: **C** (highly absorbent)

## Random PLUS 8/15/20 R

Perforation ratio: **9.9 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.2 | 0.4 | 0.7 | 0.7 | 0.35 | 0.35 |
|---|---|---|---|---|---|---|

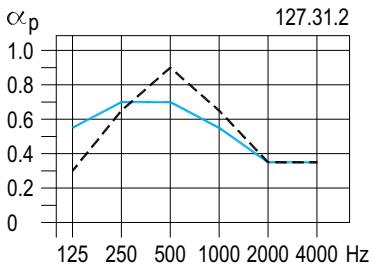
$\alpha_w$ = **0.45 (M)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.5 | 0.7 | 0.75 | 0.5 | 0.35 | 0.3 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.40 (LM)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.3 | 0.65 | 0.9 | 0.65 | 0.35 | 0.35 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.45 (LM)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.55 | 0.7 | 0.7 | 0.55 | 0.35 | 0.35 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.45 (LM)** class: **D** (absorbent)

scheme drawings, face side

| **Note** | Regard comment on page 5 |
|---|---|

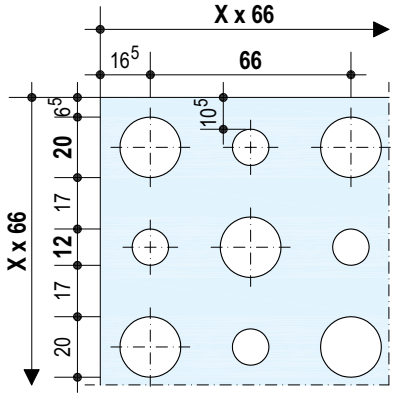
| **Proofs** | Knauf Sound Insulation Proofs: A 002-05.05; A 003-05.05; A 004-05.05 |
|---|---|

# D127 Knauf Cleaneo Acoustic Design Ceiling

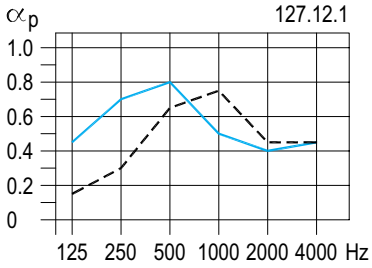
**Sound Absorption, Continuous Perforation**

## Alternating Circular 12/20/66 R

Perforation ratio: **19.6 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.15 | 0.3 | 0.65 | 0.75 | 0.45 | 0.45 |
|---|---|---|---|---|---|---|

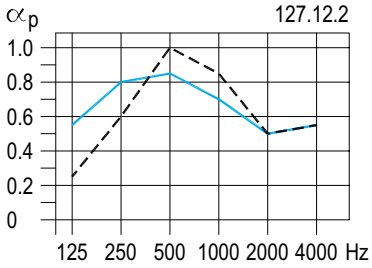
$\alpha_w$ = **0.50 (M)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.45 | 0.7 | 0.8 | 0.5 | 0.4 | 0.45 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.50 (LM)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.25 | 0.6 | 1 | 0.85 | 0.5 | 0.55 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.60 (M)** class: **C** (highly absorbent)

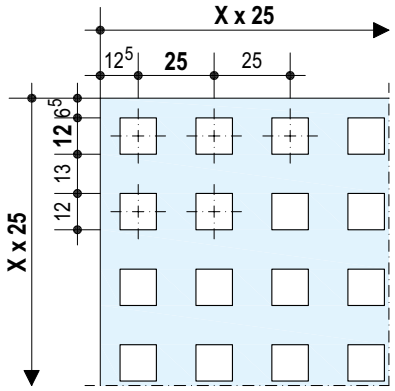
**plenum height 200 mm**

| $\alpha_p$ | 0.55 | 0.8 | 0.85 | 0.7 | 0.5 | 0.55 |
|---|---|---|---|---|---|---|

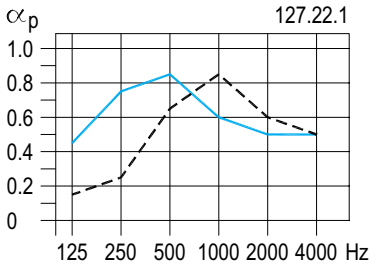
$\alpha_w$ = **0.60 (LM)** class: **C** (highly absorbent)

## Standard Square 12/25 Q

Perforation ratio: **23.0 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.15 | 0.25 | 0.65 | 0.85 | 0.6 | 0.5 |
|---|---|---|---|---|---|---|

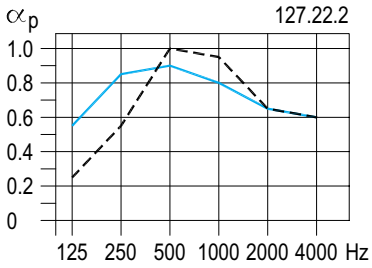
$\alpha_w$ = **0.55 (M)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.45 | 0.75 | 0.85 | 0.6 | 0.5 | 0.5 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.60 (LM)** class: **C** (highly absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.25 | 0.55 | 1 | 0.95 | 0.65 | 0.6 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.70 (M)** class: **C** (highly absorbent)

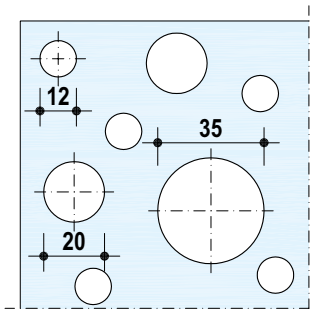
**plenum height 200 mm**

| $\alpha_p$ | 0.55 | 0.85 | 0.9 | 0.8 | 0.65 | 0.6 |
|---|---|---|---|---|---|---|

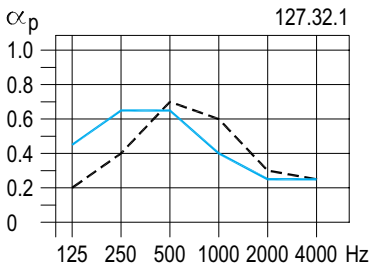
$\alpha_w$ = **0.70 (L)** class: **C** (highly absorbent)

## Random PLUS 12/20/35 R

Perforation ratio: **9.8 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.2 | 0.4 | 0.7 | 0.6 | 0.3 | 0.25 |
|---|---|---|---|---|---|---|

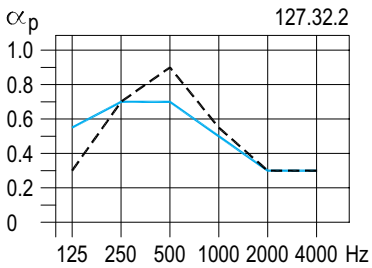
$\alpha_w$ = **0.35 (LM)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.45 | 0.65 | 0.65 | 0.4 | 0.25 | 0.25 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.35 (LM)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.3 | 0.7 | 0.9 | 0.55 | 0.3 | 0.3 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.40 (LM)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.55 | 0.7 | 0.7 | 0.5 | 0.3 | 0.3 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.40 (LM)** class: **D** (absorbent)

scheme drawings, face side

**Note** Regard comment on page 5

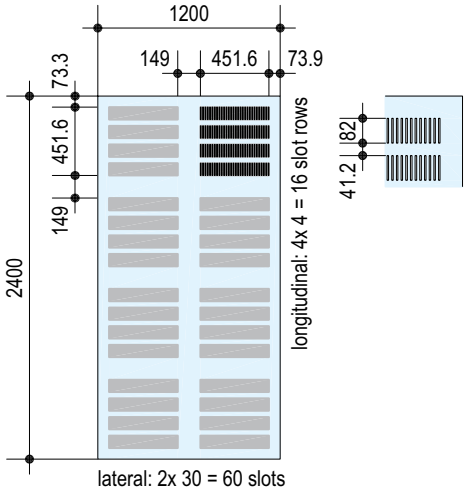
**Proofs** Knauf Sound Insulation Proofs: A 002-05.05; A 003-05.05; A 004-05.05

# D127 Knauf Cleaneo Acoustic Design Ceiling

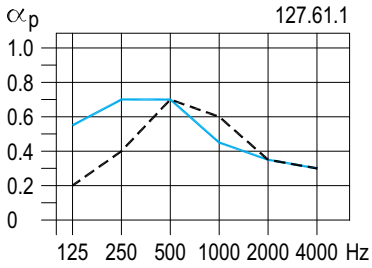
**Sound Absorption, Block Slots “slotline”**

## Design B4 - "slotline"

Slot ratio: **13.7 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.2 | 0.4 | 0.7 | 0.6 | 0.35 | 0.3 |
|---|---|---|---|---|---|---|

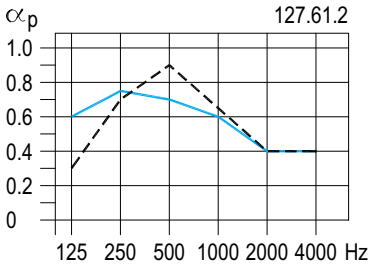
$\alpha_w$ **= 0.40 (M)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.55 | 0.7 | 0.7 | 0.45 | 0.35 | 0.3 |
|---|---|---|---|---|---|---|

$\alpha_w$ **= 0.40 (LM)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.3 | 0.7 | 0.9 | 0.65 | 0.4 | 0.4 |
|---|---|---|---|---|---|---|

$\alpha_w$ **= 0.50 (LM)** class: **D** (absorbent)

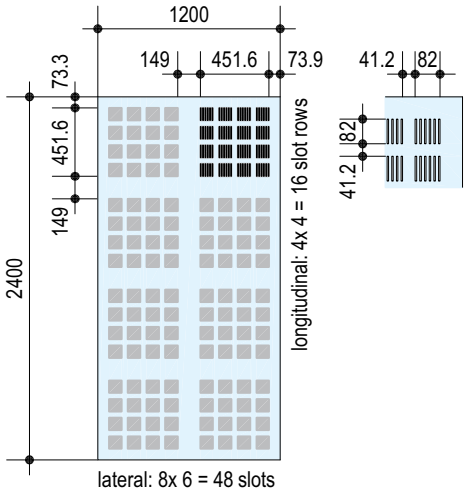
**plenum height 200 mm**

| $\alpha_p$ | 0.6 | 0.75 | 0.7 | 0.6 | 0.4 | 0.4 |
|---|---|---|---|---|---|---|

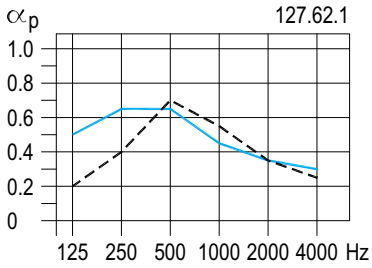
$\alpha_w$ **= 0.50 (L)** class: **D** (absorbent)

## Design B5 - "slotline"

Slot ratio: **10.9 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.2 | 0.4 | 0.7 | 0.55 | 0.35 | 0.25 |
|---|---|---|---|---|---|---|

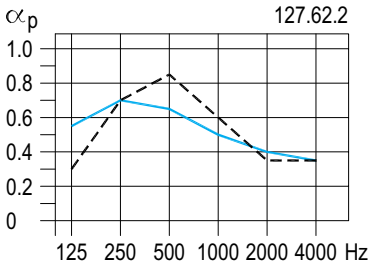
$\alpha_w$ **= 0.40 (M)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.5 | 0.65 | 0.65 | 0.45 | 0.35 | 0.3 |
|---|---|---|---|---|---|---|

$\alpha_w$ **= 0.40 (LM)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.3 | 0.7 | 0.85 | 0.6 | 0.35 | 0.35 |
|---|---|---|---|---|---|---|

$\alpha_w$ **= 0.45 (LM)** class: **D** (absorbent)

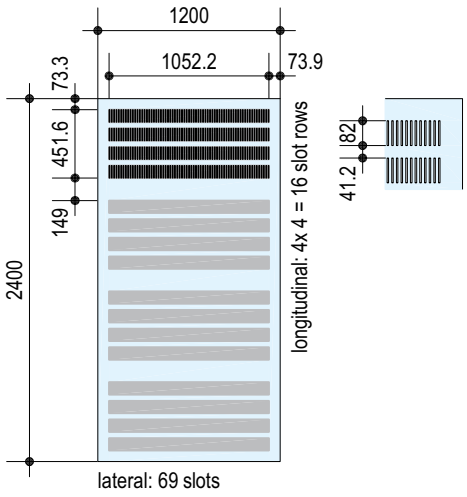
**plenum height 200 mm**

| $\alpha_p$ | 0.55 | 0.7 | 0.65 | 0.5 | 0.4 | 0.35 |
|---|---|---|---|---|---|---|

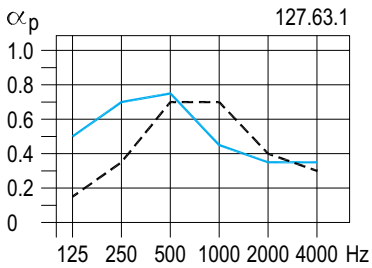
$\alpha_w$ **= 0.45 (L)** class: **D** (absorbent)

## Design B6 - "slotline"

Slot ratio: **15.7 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.15 | 0.35 | 0.7 | 0.7 | 0.4 | 0.3 |
|---|---|---|---|---|---|---|

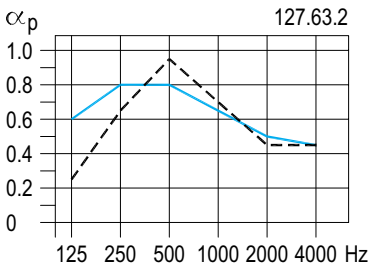
$\alpha_w$ **= 0.45 (M)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.5 | 0.7 | 0.75 | 0.45 | 0.35 | 0.35 |
|---|---|---|---|---|---|---|

$\alpha_w$ **= 0.45 (LM)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.25 | 0.65 | 0.95 | 0.7 | 0.45 | 0.45 |
|---|---|---|---|---|---|---|

$\alpha_w$ **= 0.55 (LM)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.6 | 0.8 | 0.8 | 0.65 | 0.5 | 0.45 |
|---|---|---|---|---|---|---|

$\alpha_w$ **= 0.55 (LM)** class: **D** (absorbent)

scheme drawings, dimensions are optical specifications, see page 4



**Note** Regard comment on page 5

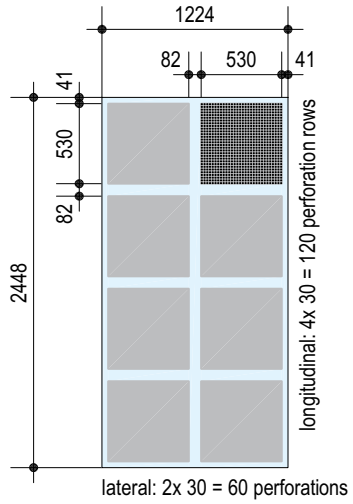
**Proof** Knauf Sound Insulation Proof: A 005-05.05

# D127 Knauf Cleaneo Acoustic Design Ceiling

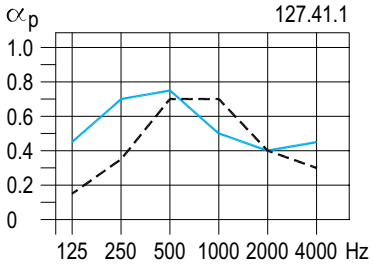
**Sound Absorption, Block Perforation 8/18 R**

## Design B4 - 8/18 R

Perforation ratio: **12.1 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.15 | 0.35 | 0.7 | 0.7 | 0.4 | 0.3 |
|---|---|---|---|---|---|---|

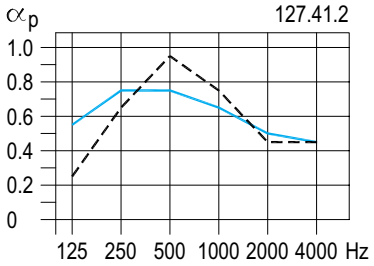
$\alpha_w$ = **0.45 (M)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.45 | 0.7 | 0.75 | 0.5 | 0.4 | 0.45 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.50 (LM)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.25 | 0.65 | 0.95 | 0.75 | 0.45 | 0.45 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.55 (LM)** class: **D** (absorbent)

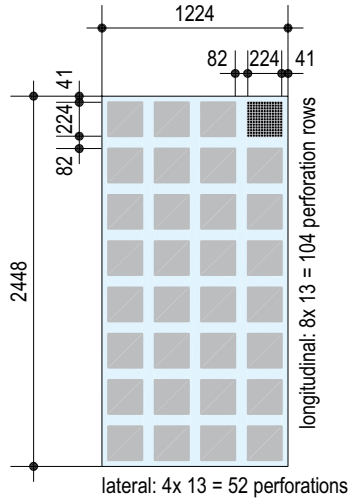
**plenum height 200 mm**

| $\alpha_p$ | 0.55 | 0.75 | 0.75 | 0.65 | 0.5 | 0.45 |
|---|---|---|---|---|---|---|

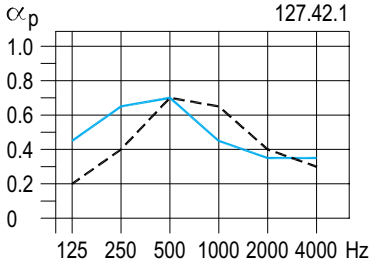
$\alpha_w$ = **0.55 (L)** class: **D** (absorbent)

## Design B5 - 8/18 R

Perforation ratio: **9.1 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.2 | 0.4 | 0.7 | 0.65 | 0.4 | 0.3 |
|---|---|---|---|---|---|---|

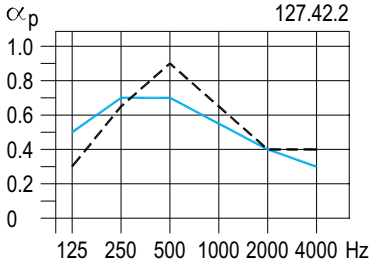
$\alpha_w$ = **0.45 (M)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.45 | 0.65 | 0.7 | 0.45 | 0.35 | 0.35 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.45 (LM)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.3 | 0.65 | 0.9 | 0.65 | 0.4 | 0.4 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.50 (LM)** class: **D** (absorbent)

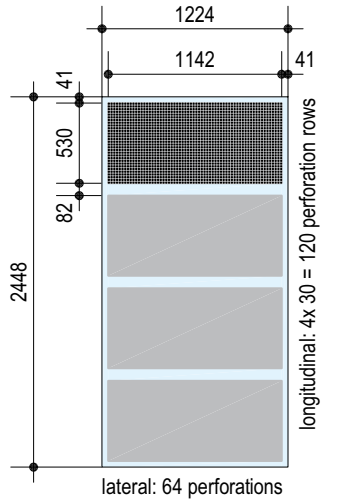
**plenum height 200 mm**

| $\alpha_p$ | 0.5 | 0.7 | 0.7 | 0.55 | 0.4 | 0.3 |
|---|---|---|---|---|---|---|

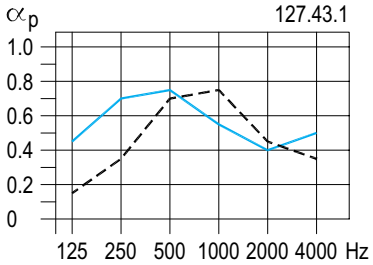
$\alpha_w$ = **0.45 (LM)** class: **D** (absorbent)

## Design B6 - 8/18 R

Perforation ratio: **12.9 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.15 | 0.35 | 0.7 | 0.75 | 0.45 | 0.35 |
|---|---|---|---|---|---|---|

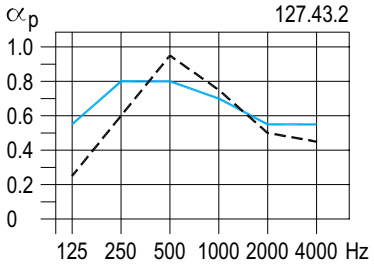
$\alpha_w$ = **0.50 (M)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.45 | 0.7 | 0.75 | 0.55 | 0.4 | 0.5 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.50 (LM)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.25 | 0.6 | 0.95 | 0.75 | 0.5 | 0.45 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.55 (LM)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.55 | 0.8 | 0.8 | 0.7 | 0.55 | 0.55 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.65 (L)** class: **C** (highly absorbent)

scheme drawings, dimensions are optical specifications, see page 4

**Note** Regard comment on page 5

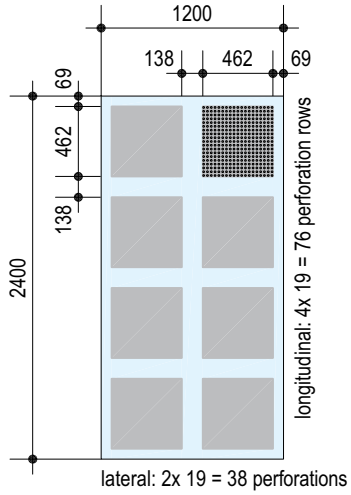
**Proof** Knauf Sound Insulation Proof: A 006-05.05

# D127 Knauf Cleaneo Acoustic Design Ceiling

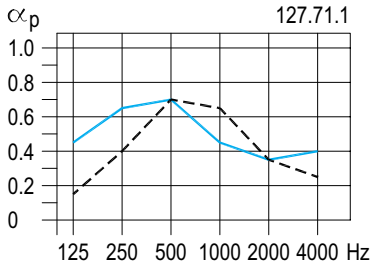
**Sound Absorption, Block Perforation 12/25 R**

## Design B4 - 12/25 R

Perforation ratio: **11.3 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.15 | 0.4 | 0.7 | 0.65 | 0.35 | 0.25 |
|---|---|---|---|---|---|---|

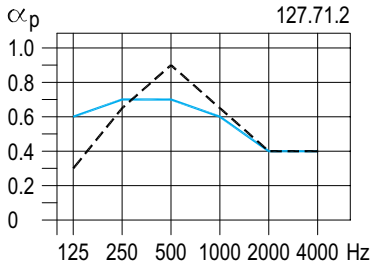
$\alpha_w$ **= 0.40 (M)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.45 | 0.65 | 0.7 | 0.45 | 0.35 | 0.4 |
|---|---|---|---|---|---|---|

$\alpha_w$ **= 0.45 (LM)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.3 | 0.65 | 0.9 | 0.65 | 0.4 | 0.4 |
|---|---|---|---|---|---|---|

$\alpha_w$ **= 0.50 (LM)** class: **D** (absorbent)

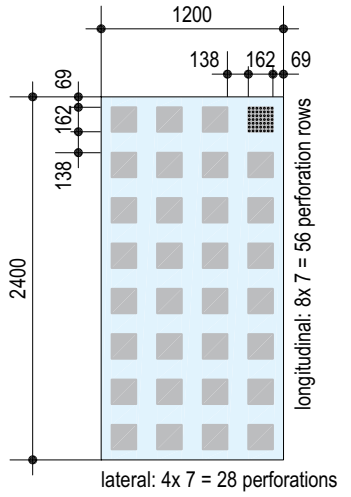
**plenum height 200 mm**

| $\alpha_p$ | 0.6 | 0.7 | 0.7 | 0.6 | 0.4 | 0.4 |
|---|---|---|---|---|---|---|

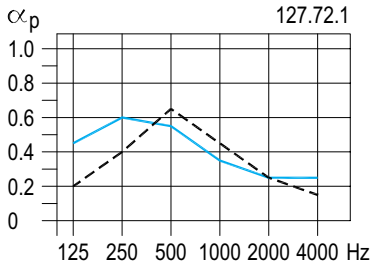
$\alpha_w$ **= 0.50 (L)** class: **D** (absorbent)

## Design B5 - 12/25 R

Perforation ratio: **6.2 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.2 | 0.4 | 0.65 | 0.45 | 0.25 | 0.15 |
|---|---|---|---|---|---|---|

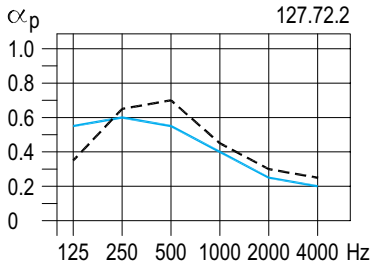
$\alpha_w$ **= 0.30 (LM)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.45 | 0.6 | 0.55 | 0.35 | 0.25 | 0.25 |
|---|---|---|---|---|---|---|

$\alpha_w$ **= 0.35 (L)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.35 | 0.65 | 0.7 | 0.45 | 0.3 | 0.25 |
|---|---|---|---|---|---|---|

$\alpha_w$ **= 0.35 (LM)** class: **D** (absorbent)

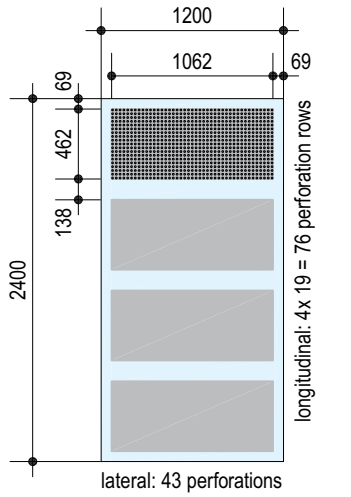
**plenum height 200 mm**

| $\alpha_p$ | 0.55 | 0.6 | 0.55 | 0.4 | 0.25 | 0.2 |
|---|---|---|---|---|---|---|

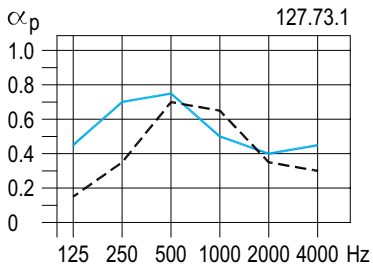
$\alpha_w$ **= 0.30 (LM)** class: **D** (absorbent)

## Design B6 - 12/25 R

Perforation ratio: **12.8 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.15 | 0.35 | 0.7 | 0.65 | 0.35 | 0.3 |
|---|---|---|---|---|---|---|

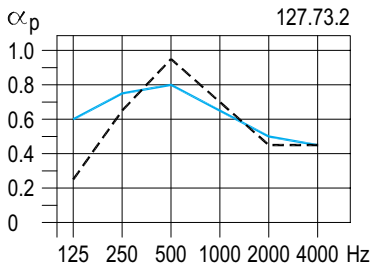
$\alpha_w$ **= 0.40 (M)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.45 | 0.7 | 0.75 | 0.5 | 0.4 | 0.45 |
|---|---|---|---|---|---|---|

$\alpha_w$ **= 0.50 (LM)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.25 | 0.65 | 0.95 | 0.7 | 0.45 | 0.45 |
|---|---|---|---|---|---|---|

$\alpha_w$ **= 0.55 (LM)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.6 | 0.75 | 0.8 | 0.65 | 0.5 | 0.45 |
|---|---|---|---|---|---|---|

$\alpha_w$ **= 0.55 (LM)** class: **D** (absorbent)

scheme drawings, dimensions are optical specifications, see page 4



**Note** Regard comment on page 5

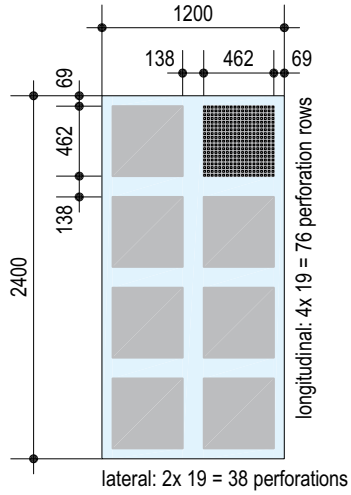
**Proof** Knauf Sound Insulation Proof: A 006-05.05

# D127 Knauf Cleaneo Acoustic Design Ceiling

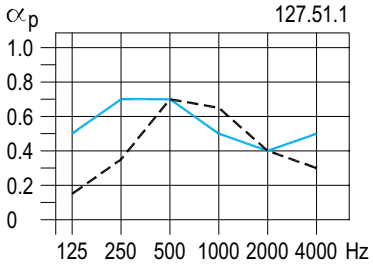
**Sound Absorption, Block Perforation 12/25 Q**

## Design B4 - 12/25 Q

Perforation ratio: **14.4 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.15 | 0.35 | 0.7 | 0.65 | 0.4 | 0.3 |
|---|---|---|---|---|---|---|

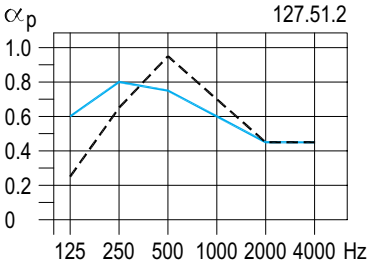
$\alpha_w$ = **0.45 (M)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.5 | 0.7 | 0.7 | 0.5 | 0.4 | 0.5 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.50 (L)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.25 | 0.65 | 0.95 | 0.7 | 0.45 | 0.45 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.55 (LM)** class: **D** (absorbent)

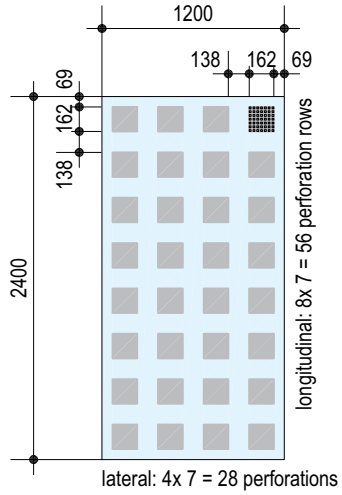
**plenum height 200 mm**

| $\alpha_p$ | 0.6 | 0.8 | 0.75 | 0.6 | 0.45 | 0.45 |
|---|---|---|---|---|---|---|

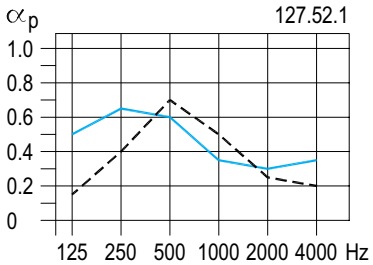
$\alpha_w$ = **0.55 (L)** class: **D** (absorbent)

## Design B5 - 12/25 Q

Perforation ratio: **7.8 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.15 | 0.4 | 0.7 | 0.5 | 0.25 | 0.2 |
|---|---|---|---|---|---|---|

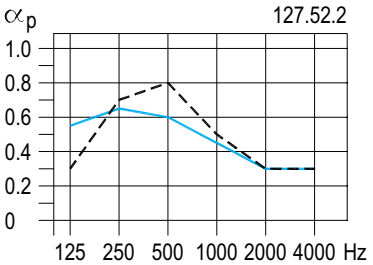
$\alpha_w$ = **0.30 (LM)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.5 | 0.65 | 0.6 | 0.35 | 0.3 | 0.35 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.35 (LM)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.3 | 0.7 | 0.8 | 0.5 | 0.3 | 0.3 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.40 (LM)** class: **D** (absorbent)

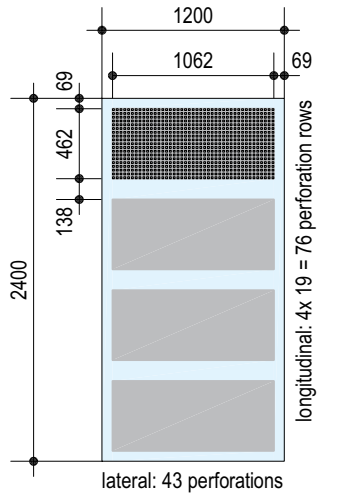
**plenum height 200 mm**

| $\alpha_p$ | 0.55 | 0.65 | 0.6 | 0.45 | 0.3 | 0.3 |
|---|---|---|---|---|---|---|

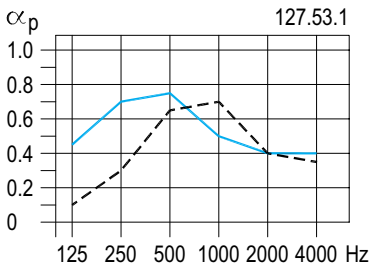
$\alpha_w$ = **0.40 (L)** class: **D** (absorbent)

## Design B6 - 12/25 Q

Perforation ratio: **16.3 %**




**• with Standard Fleece**




**plenum height 60 mm**

| $\alpha_p$ | 0.1 | 0.3 | 0.65 | 0.7 | 0.4 | 0.35 |
|---|---|---|---|---|---|---|

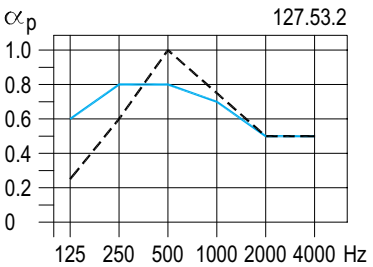
$\alpha_w$ = **0.45 (M)** class: **D** (absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.45 | 0.7 | 0.75 | 0.5 | 0.4 | 0.4 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.50 (LM)** class: **D** (absorbent)

**• with Standard Fleece + mineral wool**




**plenum height 60 mm**

| $\alpha_p$ | 0.25 | 0.6 | 1 | 0.75 | 0.5 | 0.5 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.60 (M)** class: **C** (highly absorbent)

**plenum height 200 mm**

| $\alpha_p$ | 0.6 | 0.8 | 0.8 | 0.7 | 0.5 | 0.5 |
|---|---|---|---|---|---|---|

$\alpha_w$ = **0.60 (L)** class: **C** (highly absorbent)

scheme drawings, dimensions are optical specifications, see page 4

**Note** Regard comment on page 5

**Proof** Knauf Sound Insulation Proof: A 007-05.05

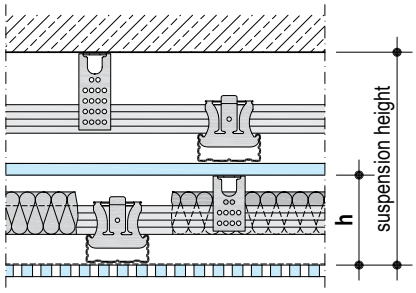
# D124 Knauf Cleaneo Acoustic Ceilings

**Sound Absorption, Ceiling Construction / Continuous Perforation**

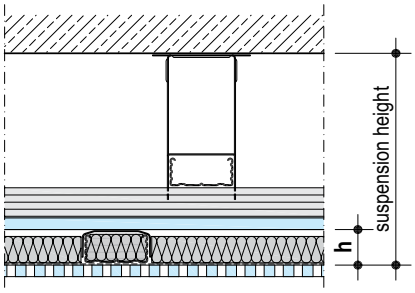
## Ceiling construction for systems D124 Cleaneo Acoustic Fire Protection Ceiling

scheme drawings

**D124**
2nd grid level with Universal Bracket




**D124**
2nd grid level with Direct Bracket



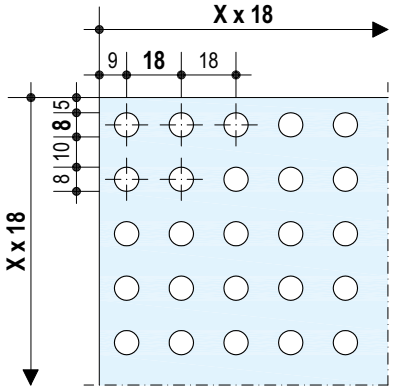

**Note:**

- The main parameter for the acoustical efficiency of the system is the clearance (h) between Cleaneo Acoustic Board and the non-perforated gypsum board.
- The suspension height of the system (space between Cleaneo Acoustic Board and basic ceiling) is of low influence for the acoustical efficiency. Therefore, different suspension heights can be used for the specified parameters.

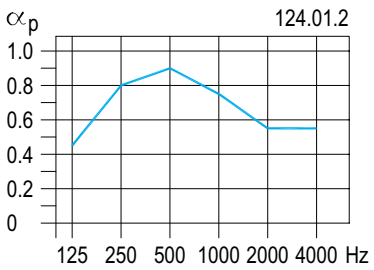
## Continuous perforations

### Standard Circular 8/18 R

Perforation ratio: **15.5 %**




**• D124 with Universal Bracket**
with Standard Fleece + mineral wool

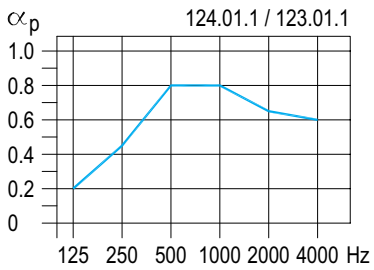



**suspension height 200 mm**
(h = 100 mm)

| αp | 0.45 | 0.8 | 0.9 | 0.75 | 0.55 | 0.55 |
|---|---|---|---|---|---|---|

$\alpha_w$ **= 0.65 (LM)** class: **C** (highly absorbent)

**• D124 with Direct Bracket**
with Standard Fleece + mineral wool



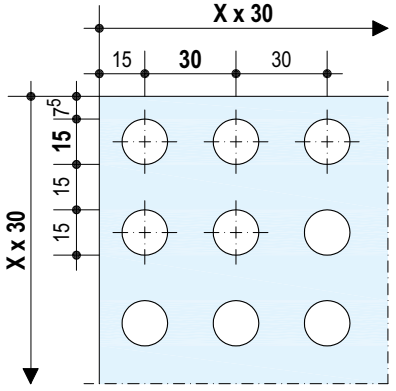

**suspension height 200 mm**
(h = approx. 28 mm)

| αp | 0.2 | 0.45 | 0.8 | 0.8 | 0.65 | 0.6 |
|---|---|---|---|---|---|---|

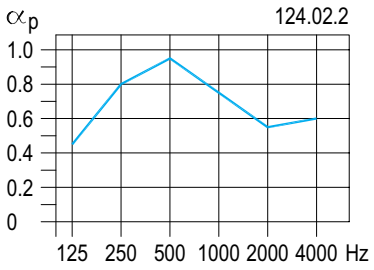
$\alpha_w$ **= 0.70** class: **C** (highly absorbent)

### Standard Circular 15/30 R

Perforation ratio: **19.6 %**




**• D124 with Universal Bracket**
with Standard Fleece + mineral wool

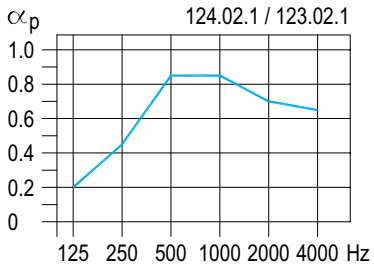



**suspension height 200 mm**
(h = 100 mm)

| αp | 0.45 | 0.8 | 0.95 | 0.75 | 0.55 | 0.6 |
|---|---|---|---|---|---|---|

$\alpha_w$ **= 0.65 (LM)** class: **C** (highly absorbent)

**• D124 with Direct Bracket**
with Standard Fleece + mineral wool




**suspension height 200 mm**
(h = approx. 28 mm)

| αp | 0.2 | 0.45 | 0.85 | 0.85 | 0.7 | 0.65 |
|---|---|---|---|---|---|---|

$\alpha_w$ **= 0.70** class: **C** (highly absorbent)

scheme drawings, face side



| **Note** | Regard comment on page 5 |
|---|---|

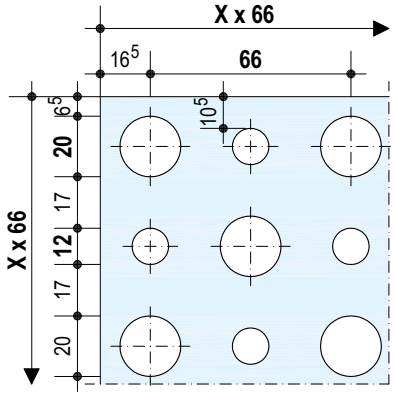
| **Proof** | Knauf Sound Insulation Proof: A 008-07.05 |
|---|---|

# D124 / Knauf Cleaneo Acoustic Ceilings

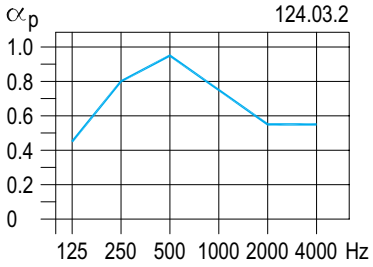
**Sound Absorption, Continuous Perforation**

## Alternating Circular 12/20/66 R

Perforation ratio: **19.6 %**




**• D124 with Universal Bracket**
with Standard Fleece + mineral wool

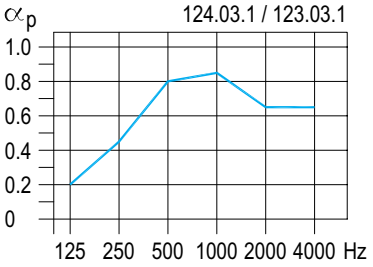



**suspension height 200 mm**
(h = 100 mm)

| | | | | | | |
|---|---|---|---|---|---|---|
| $\alpha_p$ | 0.45 | 0.8 | 0.95 | 0.75 | 0.55 | 0.55 |

$\alpha_w$ **= 0.65 (LM)** class: **C** (highly absorbent)

**• D124 with Direct Bracket**
with Standard Fleece + mineral wool



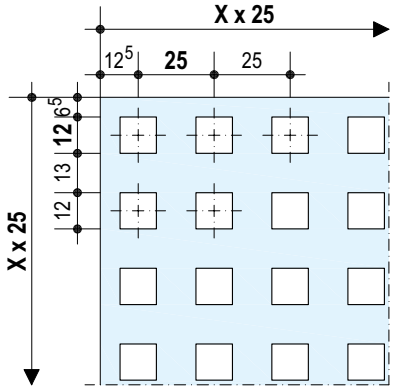

**suspension height 200 mm**
(h = approx. 28 mm)

| | | | | | | |
|---|---|---|---|---|---|---|
| $\alpha_p$ | 0.2 | 0.45 | 0.8 | 0.85 | 0.65 | 0.65 |

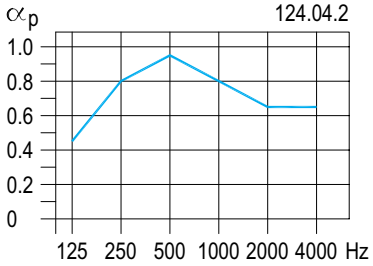
$\alpha_w$ **= 0.70** class: **C** (highly absorbent)

## Standard Square 12/25 Q

Perforation ratio: **23.0 %**




**• D124 with Universal Bracket**
with Standard Fleece + mineral wool

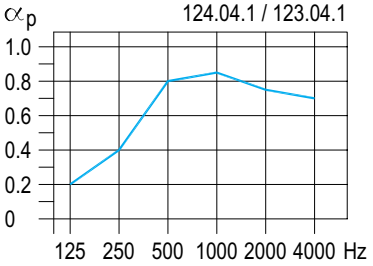



**suspension height 200 mm**
(h = 100 mm)

| | | | | | | |
|---|---|---|---|---|---|---|
| $\alpha_p$ | 0.45 | 0.8 | 0.95 | 0.8 | 0.65 | 0.65 |

$\alpha_w$ **= 0.75 (L)** class: **C** (highly absorbent)

**• D124 with Direct Bracket**
with Standard Fleece + mineral wool



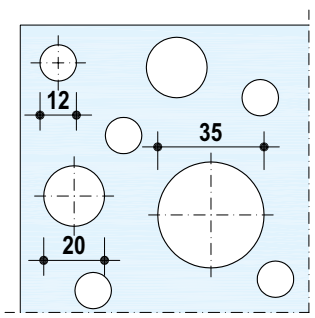

**suspension height 200 mm**
(h = approx. 28 mm)

| | | | | | | |
|---|---|---|---|---|---|---|
| $\alpha_p$ | 0.2 | 0.4 | 0.8 | 0.85 | 0.75 | 0.7 |

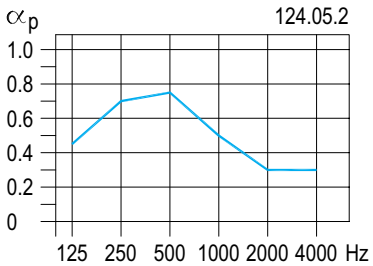
$\alpha_w$ **= 0.70** class: **C** (highly absorbent)

## Random PLUS 12/20/35 R

Perforation ratio: **9.8 %**




**• D124 with Universal Bracket**
with Standard Fleece + mineral wool

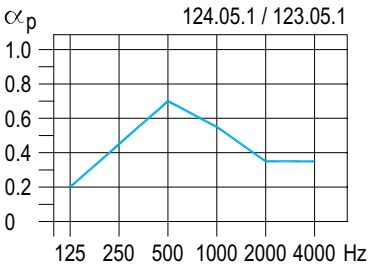



**suspension height 200 mm**
(h = 100 mm)

| | | | | | | |
|---|---|---|---|---|---|---|
| $\alpha_p$ | 0.45 | 0.7 | 0.75 | 0.5 | 0.3 | 0.3 |

$\alpha_w$ **= 0.40 (LM)** class: **D** (absorbent)

**• D124 with Direct Bracket**
with Standard Fleece + mineral wool




**suspension height 200 mm**
(h = approx. 28 mm)

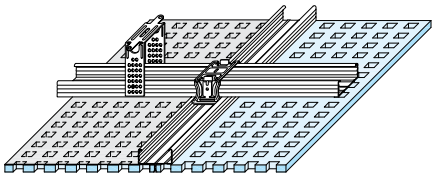
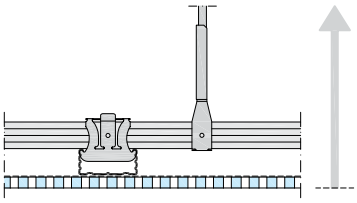
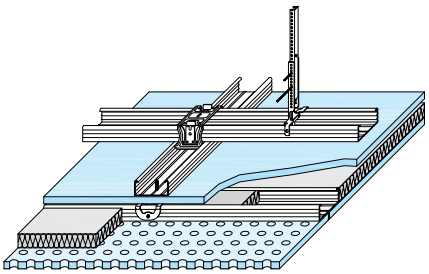
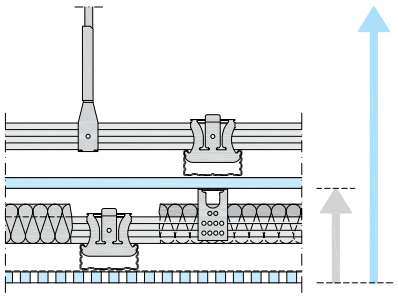
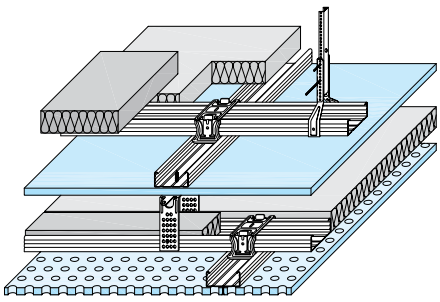
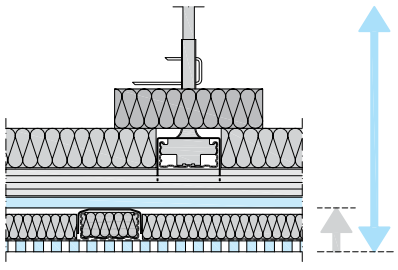
| | | | | | | |
|---|---|---|---|---|---|---|
| $\alpha_p$ | 0.2 | 0.45 | 0.7 | 0.55 | 0.35 | 0.35 |

$\alpha_w$ **= 0.45 (M)** class: **D** (absorbent)

scheme drawings face side

| **Note** | Regard comment on page 5 |
|---|---|

| **Proof** | Knauf Sound Insulation Proof: A 008-07.05 |
|---|---|

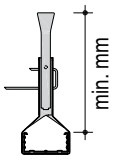
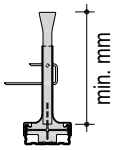
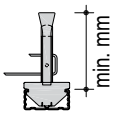
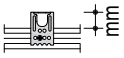
| Knauf System | Acoustic | Fire protection | Properties / Function<br>scheme drawings |
|---|---|---|---|
| **D127 Knauf Cleaneo Acoustic Design Ceiling** | | | |
|  | **sound absorption** (see pages 5 to 13) | . |  |
| **D124 Knauf Cleaneo Acoustic Fire Protection Ceiling** | | | |
|  <br>• 2nd grid level fastened with Direct Bracket | **sound absorption** (see pages 5, 14+15) | **F30 • solely from below** (mineral wool see page 21) |  <br>• 2nd grid level fastened with Universal Bracket |
|  <br>• 2nd grid level fastened with Universal Bracket | **sound absorption** (see pages 5, 14+15) | **F30 • solely fr. below + fr. above** (mineral wool see page 21) |  <br>• 2nd grid level fastened with Direct Bracket |

# D12 Knauf Cleaneo Acoustic Ceilings

**Height of Construction / Load Bearing Capacity Classes according to DIN 18168-2 / Channel Connections**

## Height of construction

height of construction = total of suspension height, height of grid and cladding thickness

| System | Suspension | | | | | Substructure | | Knauf Boards | |
|---|---|---|---|---|---|---|---|---|---|
| |  Nonius Stirrup |  Nonius Hanger Bottom |  Combo Hanger |  Universal Bracket | D124 / Multi-level Ceiling  Direct Bracket |  CD Channel wxh | total height mm | thick-ness mm | board type |
| **D127** | **130** | **130** | **130** | **up to 180** | **-** | 60x27+ 60x27 | **54** | **12.5** | Knauf Cleaneo Acoustic Board |
| **D124** | 1st grid level<br>**130**<br>**+** | **130** | **130** | **up to 180** | **-** | 60x27+ 60x27 | **54** | **12.5**<br>**+** | Knauf Fire-Resistant Board GKF |
| | 2nd grid level<br>**-**<br>**-** | **-**<br>**-** | **-**<br>**-** | **-**<br>**up to 180** | **1**<br>**-** | 60x27<br>60x27+ 60x27 | **27**<br>**54** | **12.5** | Knauf Cleaneo Acoustic Board |

Multi-level Ceiling system: height of construction depends on ceiling type

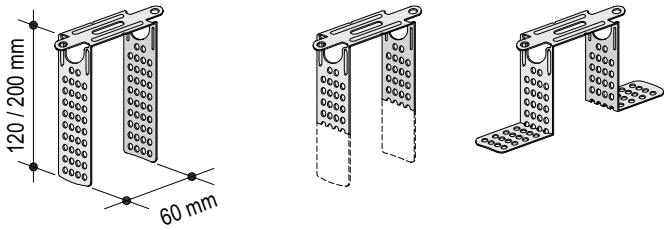
**Calculation example:** D127 with Nonius Bottom (130 mm), furring and carrying channel (54 mm) and cladding (12.5 mm) = 196.5 mm
approx. 197 mm required height of construction for Cleaneo Acoustic Design Ceiling

## 0.40 kN (40 kg) load bearing capacity class

### Universal Bracket

for CD 60x27

**Universal Bracket**
- D127 / D124 / D123



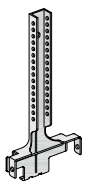

Cut or bend Universal Bracket according to required installation height

### Nonius Hanger Bottom, Nonius Stirrup, Combo Hanger

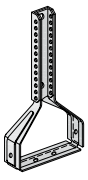
for CD 60x27

suspended with
**Nonius Hanger Top**
and
**Nonius Pin**
(secure against slide-outs)

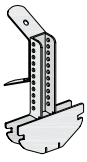
**Nonius Hanger Bottom**
- D127 / D124

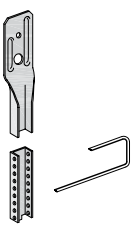


**Nonius Stirrup**
- D127 / D124



**Combo Hanger**
- D127 / D124





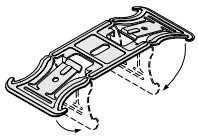
**For attachment of suspenders to basic ceiling see TDS D11 Knauf Board Ceilings**

## Channel connections

furring ch. + carrying ch.

### Intersection Connector

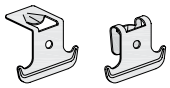
for CD 60x27



bend to 90°
before installation

alternative:

### 2x Clip for CD 60x27



bend during installation

## Additional measures

### Nonius Hanger Bottom

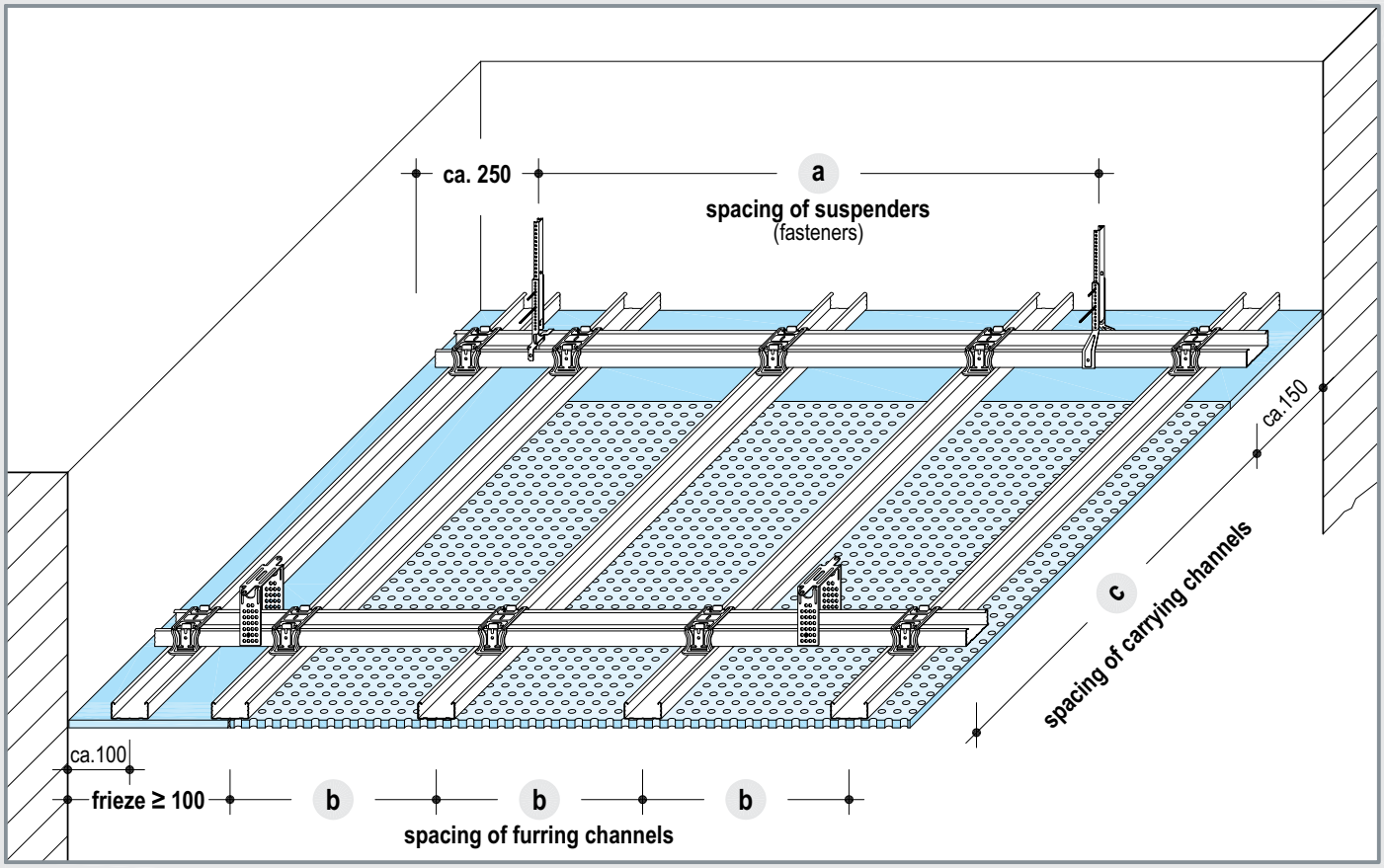
screw tabs with CD 60x27
(Metal Screws LN 3.5x9 mm) for:

- **fire protection from below and from above** (plenum)
  and / or
- **total weight of ceiling incl. loads ≥ 0.40 kN/m²**

# D127 Knauf Cleaneo Acoustic Design Ceiling

**Spacings of Substructure / Details**

## Metal grid




## Maximum grid spacings

all dimensions in mm

| Spacings of carrying channels c | Spacings of suspenders a load class kN/m² ≤ 0.15 | ≤ 0.30 | Spacing of furring channels b |
|---|---|---|---|
| 500 | 1200 | 950 | |
| 600 | 1150 | 900 | |
| 700 | 1100 | 850 | |
| 800 | 1050 | 800 | |
| 900 | 1000 | 800 | |
| 1000 | 950 | 750 | max. 333.5 |
| 1100 | 900 | 750 | |
| 1200 | 900 | 650 | |
| 1300 | 850 | - | |
| 1400 | 850 | - | |
| 1500 | 850 | - | |

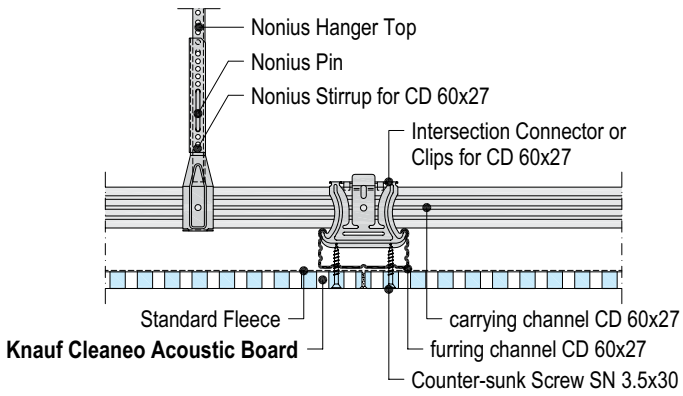
Spacing of furring channels depending on perforation (see pages 2+3)

## Note

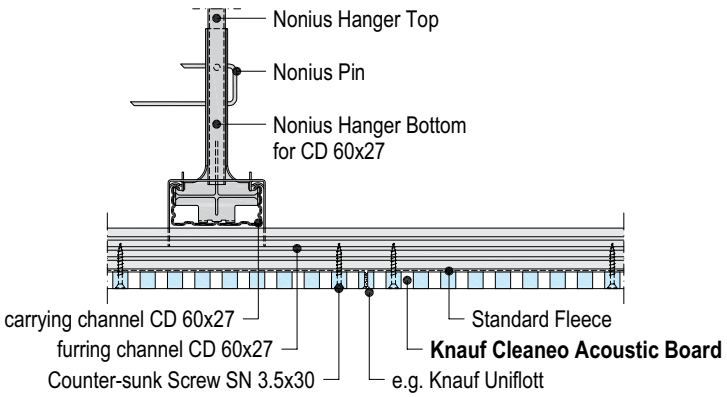
weight of boards + grid + mineral wool 20 mm
**< 15 kg/m² (0.15 kN/m²)**
The total weight of the ceiling is increased by additionally built-in layers that can cause a classification into load class up to 0.30 kN/m²
(see Technical Data Sheet D11 Knauf Board Ceilings chapter "Dimensioning of Substructure")

## Details scale 1:5

**D127-C1 Front edge joint** e.g. continuous perforation




**D127-B2 Long edge joint** e.g. continuous perforation

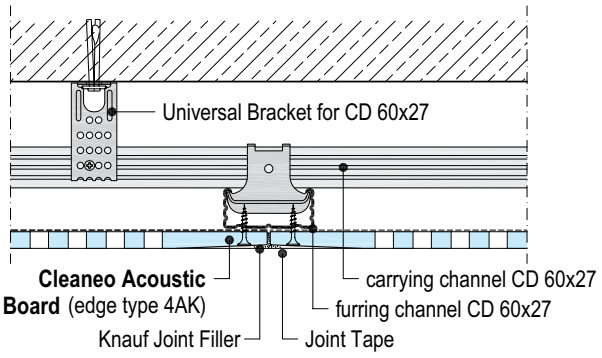


# D127 Knauf Cleaneo Acoustic Design Ceiling

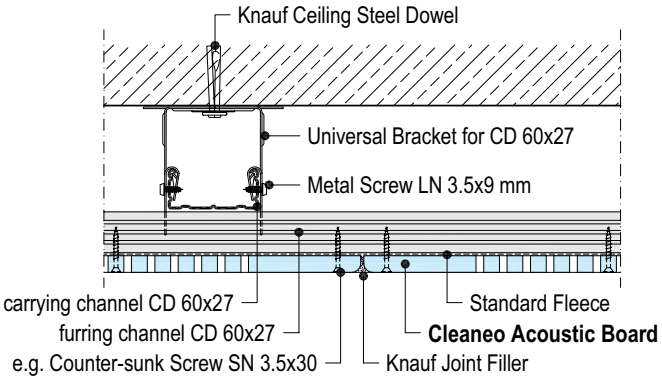
**Details**

**Details scale 1:5**

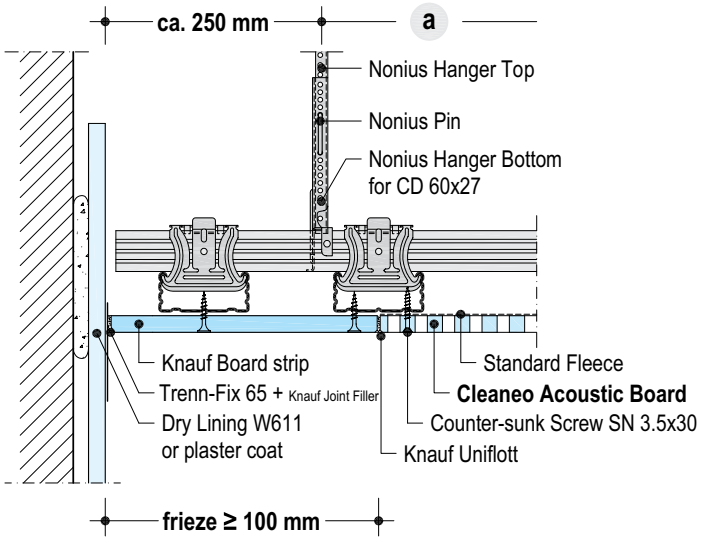
**D127-C2 Front edge joint** e.g. Block Perforation



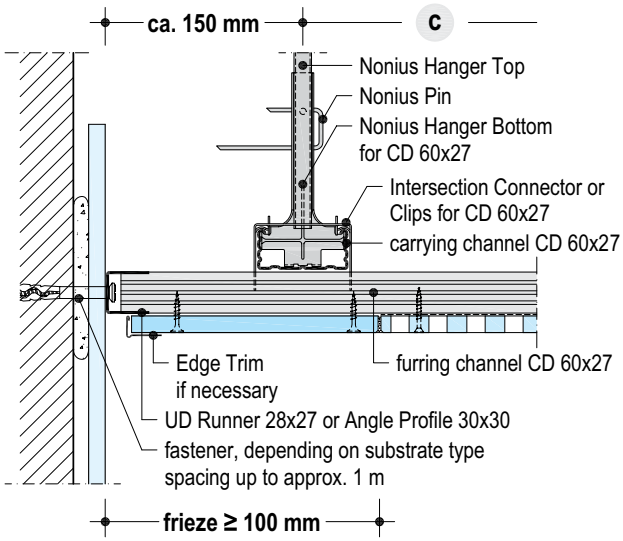

**D127-B1 Long edge joint** e.g. Block Slots "slotline"




**D127-D3 Connection to wall**



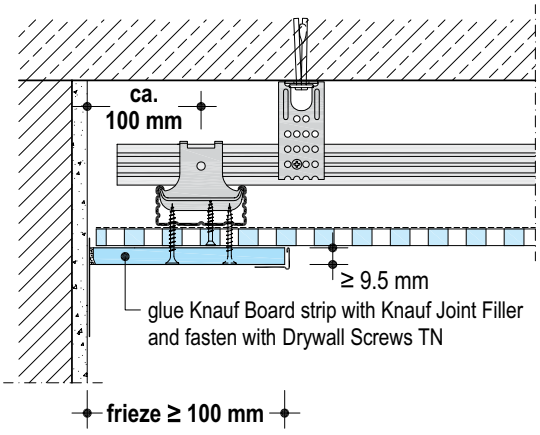

**D127-A1 Connection to wall with exposed joint**



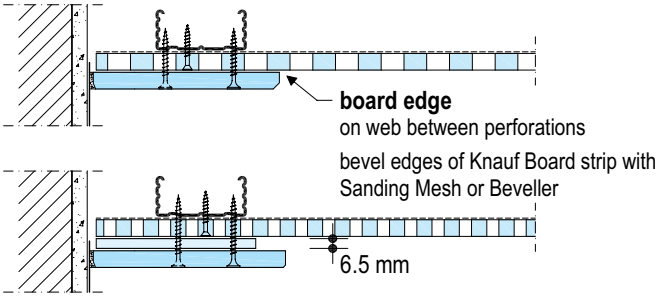
# D127 Knauf Cleaneo Acoustic Design Ceiling

**Details**

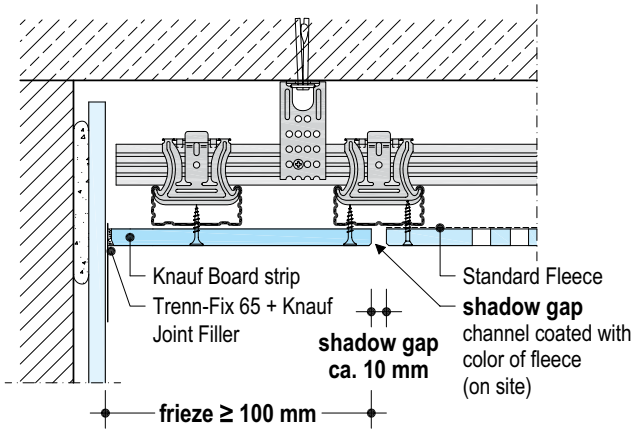
## D127-D1 Crown frieze



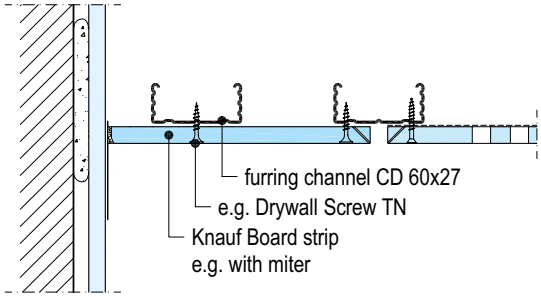

• **options**



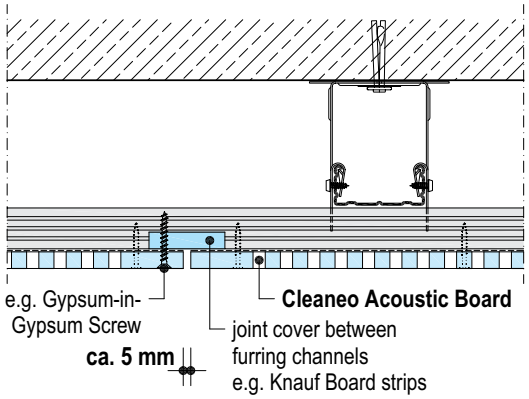

## D127-D2 Frieze with exposed joint



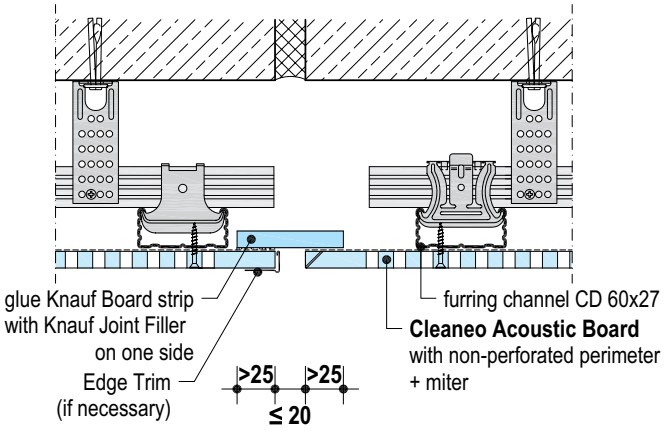

• **option**




## D127-SO12 Control joints, long edge




## D127-SO13 Settlement joints



# D124 Knauf Cleaneo Acoustic Fire Protection Ceiling

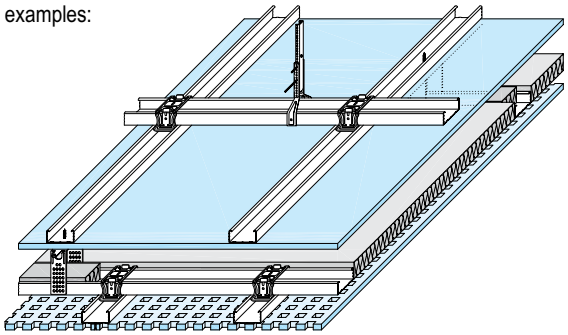
**Spacings of Substructure / Details**

**Suspended ceiling, belonging to fire resistance class on its own**

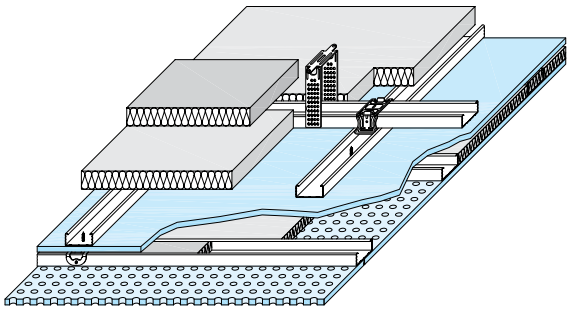
**F30** • **solely from below** / • **solely from below and from above** (plenum) Proof: ABP P-3400/4965

**for fire stress from below:** no fire protection requirements to basic ceiling / roof construction
**for fire stress from below or from above:** basic ceiling should be of the same fire protection class as the suspended ceiling

examples:



• **solely from below**
2nd grid level fastened with Universal Bracket, double grid



• **solely from below and from above**
2nd grid level fastened with Direct Bracket, single grid

## 1st Grid level, max. spacings

all dimensions in mm

| Spacing of carrying channels | Spacing of suspenders | Spacing of furring channels |
|---|---|---|
| • solely from below **1000** | **650** | **400** |
| • solely from below and from above **850** | | |

## 2nd Grid level, max. spacings

all dimensions in mm

| Spacing of carrying channels | Spacing of suspenders | Spacing of furring channels b |
|---|---|---|
| • fastened with Direct Bracket, single grid | | |
| - | 800 | max. 333.5 |
| • fastened with Universal Bracket, double grid | | |
| 800 | 800 | max. 333.5 |

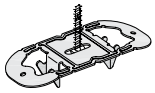
Spacing of furring channels depending on perforation (s. pages 2+3)

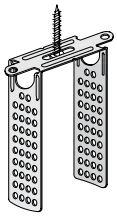
**Install suspended channels of 2nd grid level always laterally to furring channels of 1st grid level**

## 2nd Grid level, fastening

**Direct Bracket**
for CD 60x27

Bend side tabs





**Universal Bracket**
for CD 60x27

Cut or bend according to required installation height

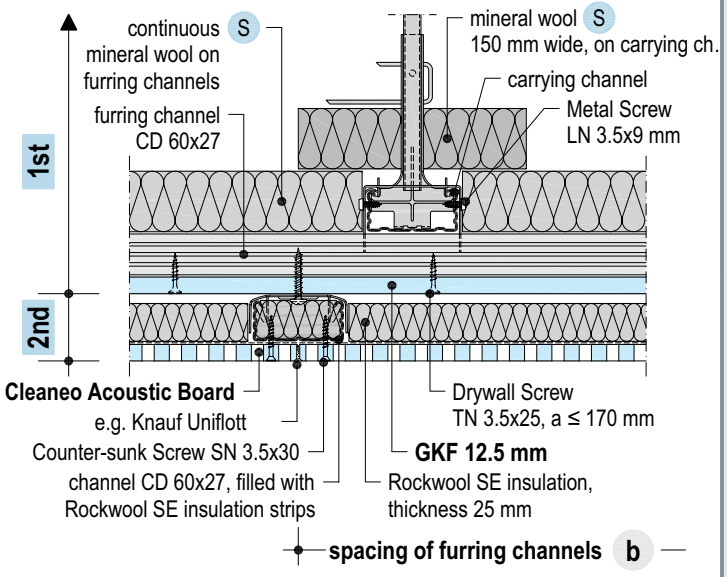
- Fasten alternating to every second furring channel of 1st grid level with Knauf All Purpose Screws FN 4.3x35 (according to ABP P-VHT-1802/05-FN)
- **Max. load of 100 N per fastening of the 2nd grid level**

**Mineral wool insulation acc. to DIN EN 13162, chapter 3.1.1**

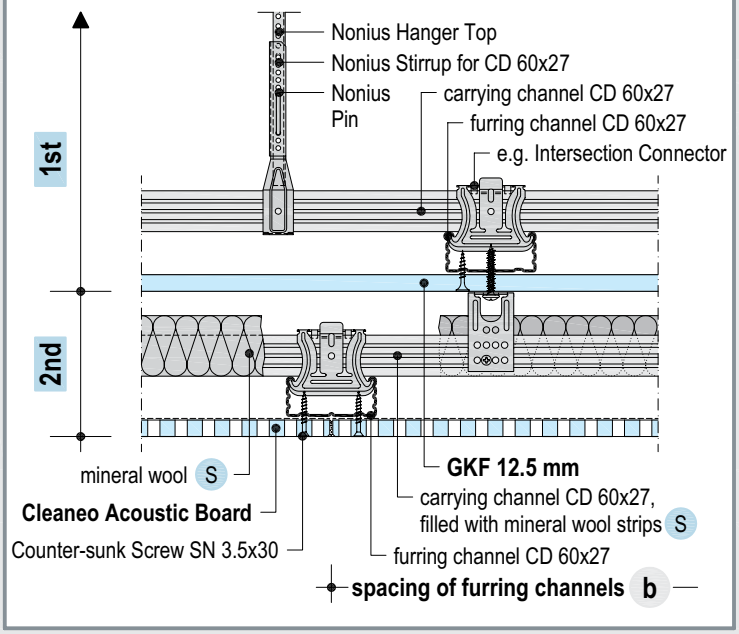
| | | |
|---|---|---|
| S | **building material class A**<br>**melting point ≥ 1000° C**<br>**according to DIN 4102-17** | **thickness 40 mm**<br>**density ≥ 40 kg/m³** |

**Details scale 1:5**

**D124vuvo-C1 Front edge joint** • solely from below and from above




**D124vu-C1 Front edge joint** • solely from below

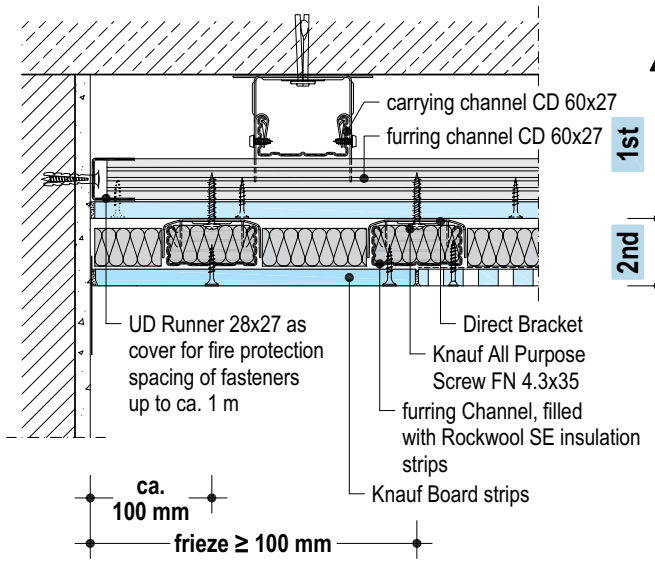


# D124 Knauf Cleaneo Acoustic Fire Protection Ceiling

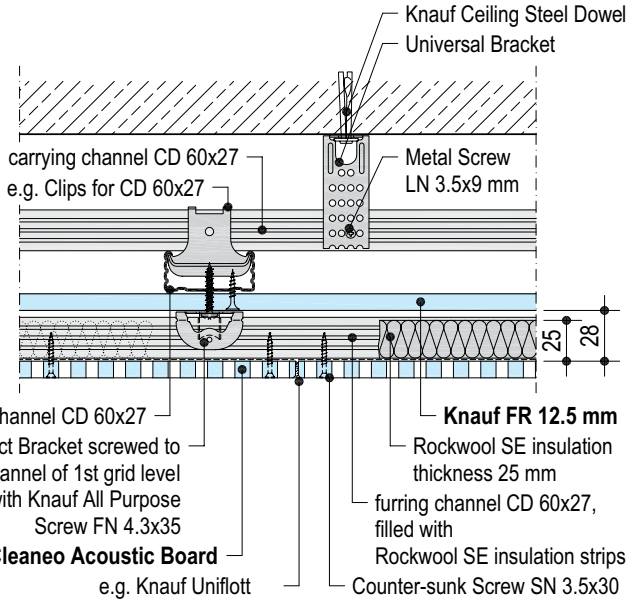
**Details**

**Details scale 1:5**

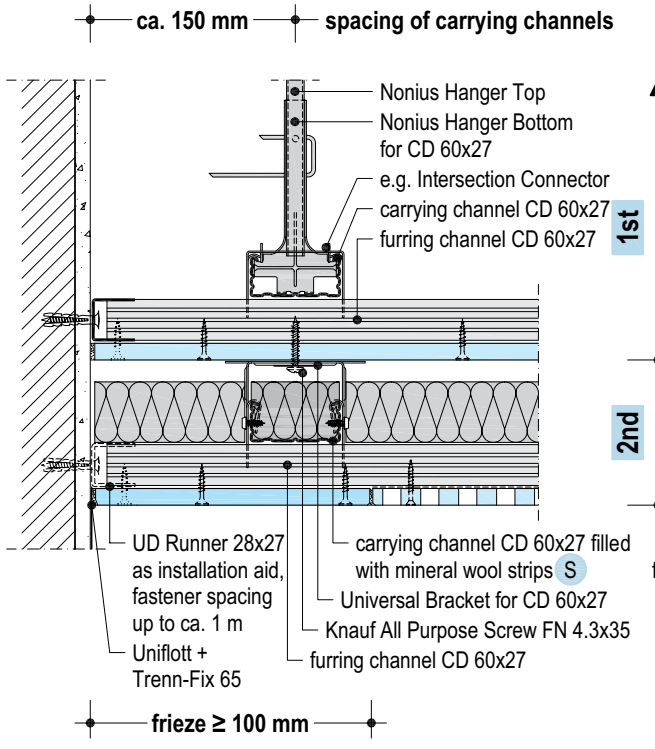
## D124vu-A1 Connection to wall • solely from below



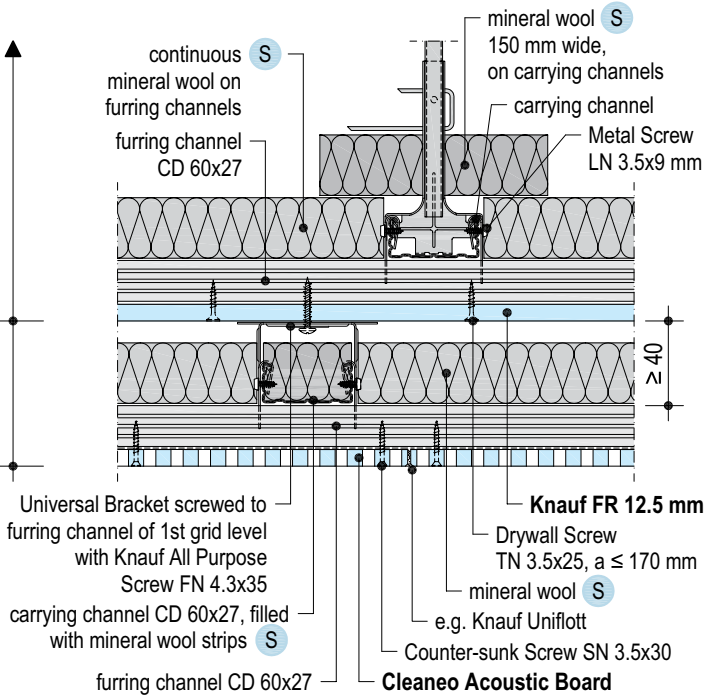

## D124vu-B1 Long edge joint • solely from below




## D124vu-A2 Connection to wall • solely from below




## D124vuvo-B1 Long edge joint • solely from below + from above



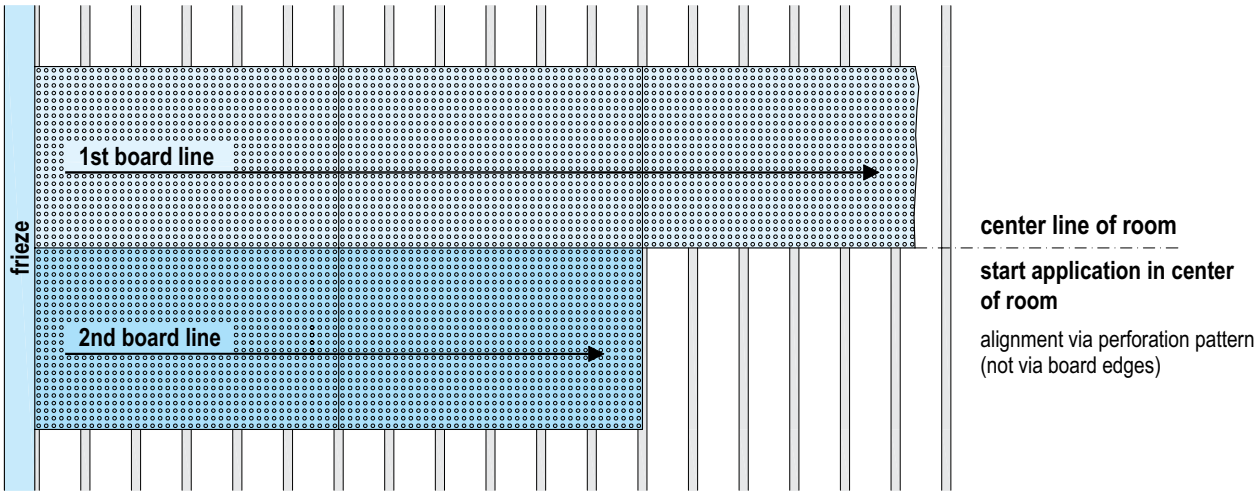

**Note** Mineral wool S see page 21

# D12 Knauf Cleaneo Acoustic Ceilings

## Application of Knauf Cleaneo Acoustic Boards

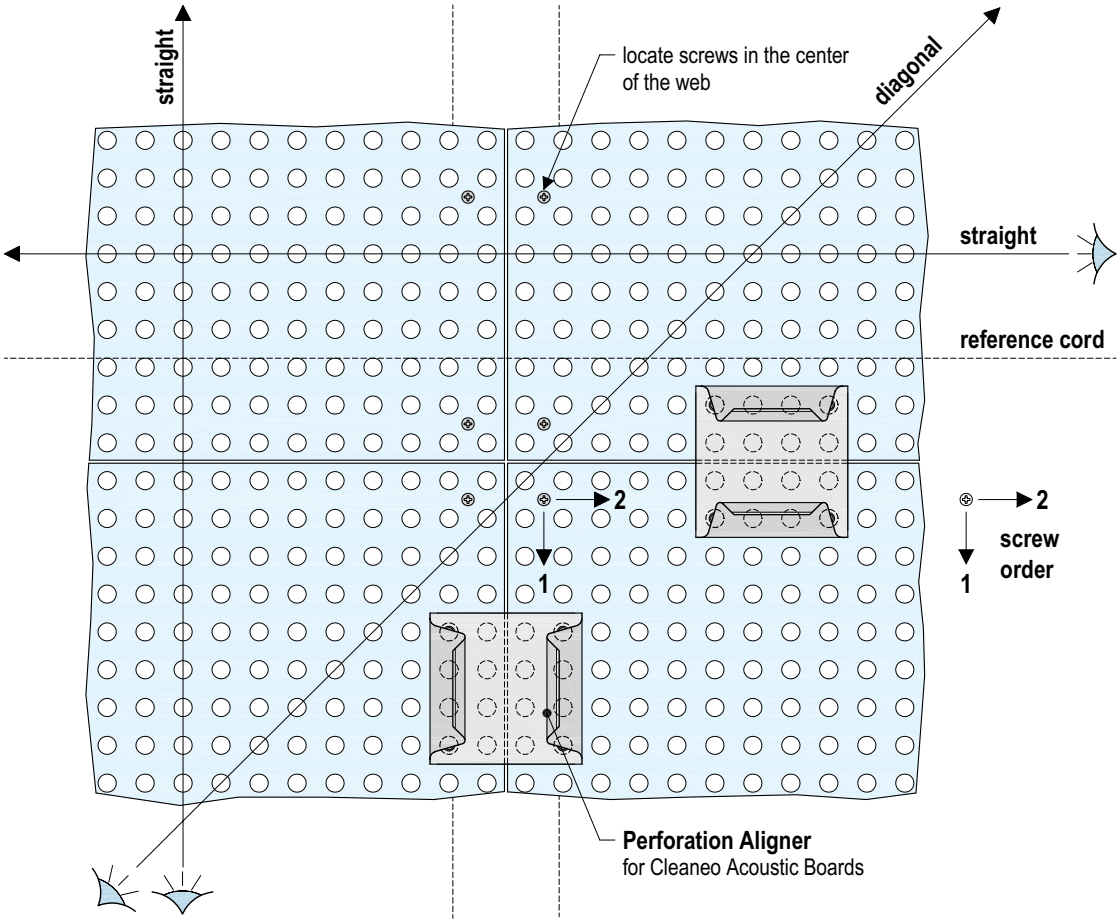
### Sequence of application

scheme drawing




### Board application

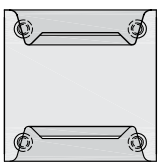
scheme drawing




**Notes**

- **Check overall appearance of the ceiling constantly by alignment via the straights and diagonals of the perforation rows**
- **Cleaneo Acoustic Boards are applied with cross joints**
  Cleaneo Acoustic Boards with standard and alternating perforation patterns are color-coded in red and blue along the front and long edges
  Place red board markings adjacent to blue marking along front and long edges during installation.
- **The Perforation Aligner is only meant for checking perforation spacing during installation.**

### Perforation Aligner for Cleaneo Acoustic Boards

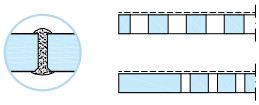
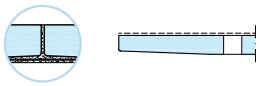
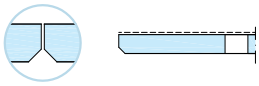


available for perforations:
**6/18 R, 8/18 R, 10/23 R, 12/25 R, 15/30 R, 8/12/50 R, 12/20/66 R**

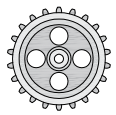
# D12 Knauf Cleaneo Acoustic Ceilings

**Jointing / Application / Attachment of Knauf Boards**

## Edge types, joint filling and application

| Edge type | Filling compound<br>Uniflott | Fugenfüller / F2F | Frieze<br>made of non-perforated board strips |
|---|---|---|---|
| **4SK** 4-side square edge  | Bevel face side edges of Cleaneo Acoustic Board with Sanding Mesh<br>Prime edges with Knauf Tiefengrund primer<br>Align boards via perforation pattern<br>Fill joints fully with Knauf Joint Filler | Unsuitable | Bevel cut edges of board strips (SK) on face side with Sanding Mesh<br>Prime cut edges with Knauf Tiefengrund primer<br>Apply boards with 3 to 4 mm joint width<br>Fill joints fully with Knauf Joint Filler |
| **4AK** 4-side tapered edge  | Butt-joint board edges<br>Apply joint tape while filling the joints | Butt-joint board edges<br>Apply joint tape while filling the joints | Use board strips with tapered long edge (AK)<br>Butt-joint board edges<br>Fill with Knauf Uniflott / Fugenfüller / F2F and Joint Tape |
| **FK** 45° beveled edge (factory made)  | 45° beveled edge (factory made)<br>Butt-joint board edges<br>Visible joint | | Bevel board strips to 45° |

## Pilot Wheel

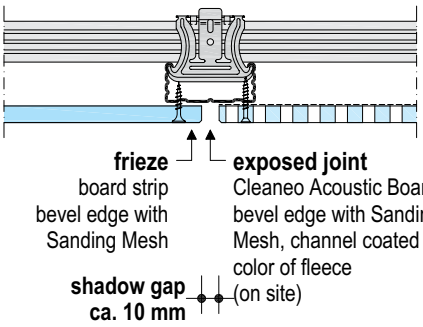


To clean perforations after hardening of the filling compound
Available for perforations:
6/18 R, 8/18 R, 10/23 R, 12/25 R, 15/30 R
(order handle separately)

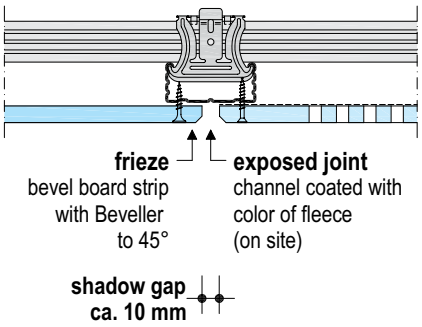
## Frieze, unfilled

scheme drawings

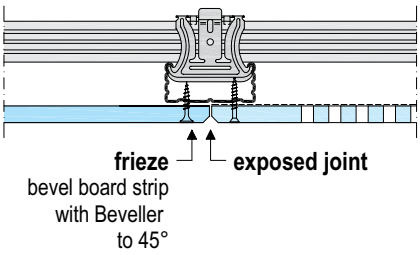
- Frieze, front edge **4SK**




- Frieze, front edge **FK**



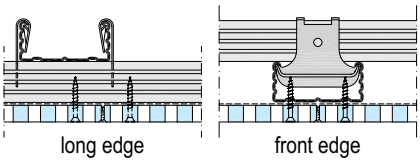

- Frieze, front edge **FK**



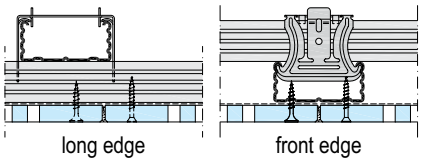

## Attachment of Knauf Boards

- **spacing of screws 170 mm**

- Perforation pattern: **SN 3.5x30**




- non-perforated perimeter: **TN 3.5x25** or **SN 3.5x30**



# D12 Knauf Cleaneo Acoustic Ceilings

**Consumption of Material** of selected examples

**Consumption of material per m² ceiling without allowance for loss and cut-off.** Amounts refer to ceiling area of: 10 m x 10 m = 100 m²

| Description<br>*italic = not provided by Knauf* | Unit | Amount as average value<br>D127 | <br>D124 |
|---|---|---|---|
| **connection to wall** | | | |
| UD Runner 28x27x0.6; length 3 m | m | as required | 0.8 |
| *fastener approved for substrate*<br>e.g. Knauf Ceiling Steel Dowel for reinforced concrete | pcs | as required | 0.8 |
| **substructure** | | | |
| alt. Knauf Ceiling Steel Dowel (for reinforced concrete)<br>*approved fastener* | pcs | 1.3 | 1.9<br>- |
| Universal Bracket for CD 60x27<br>Metal Screws 2x LN 3.5x9 mm (fastening to CD Channel) | pcs | 1.3<br>2.6 | 1.9<br>3.8 |
| or Nonius Hanger Top | pcs | 1.3 | 1.9 |
| Nonius Pin | | 1.3 | 1.9 |
| Nonius Hanger Bottom for CD 60x27 | | 1.3 | 1.9 |
| Metal Screws 2x LN 3.5x9 mm (fastening to CD Channel) | | - | 3.8 |
| alt. | | 1.3 | 1.9 |
| alt. Nonius Stirrup for CD 60x27 | | 1.3 | 1.9 |
| Metal Screws 2x LN 3.5x9 mm (fastening to CD Channel) | | - | - |
| Knauf All Purpose Screw FN 4.3x35 **2nd grid level** | pcs | - | 2 |
| Universal Bracket for CD 60x27 **2nd grid level** | pcs | - | 2 |
| Metal Screws 2x LN 3.5x9 mm (fastening to CD Channel) | | - | 4 |
| CD Channel 60x27x0.6; length 4 m | m | 4.3 | 8.3 |
| Multi-Connector for CD 60x27 (as longitudinal connection for CD Channels) | pcs | 0.9 | 1.7 |
| alt. Intersection Connector for CD 60x27 | pcs | 3.7 | 7.5 |
| 2x Clip for CD 60x27 | | 7.4 | 15 |
| *mineral wool (regard fire protection specifications, see page 21)* | m² | as required | 2.2 |
| **cladding** | | | |
| Knauf Cleaneo Acoustic Board, 12.5 mm; with Standard Fleece black or white | m² | 1 | 1 |
| Knauf Fire-Resistant Board GKF, 12.5 mm | | - | 1 |
| Knauf Screws; (fastening of cladding) | | | |
| Counter-sunk Screw SN 3.5x30 mm (Cleaneo Acoustic Board) | pcs | 23 | 23 |
| Drywall Screw TN 3.5x25 mm (GKF) and (U-type Encasement) | | - | 20 |
| **jointing** | | | |
| filling compound e.g. Uniflott, Fugenfüller or F2F | kg | as required *) | as required *) |
| Joint Tape | m | as required | as required |

*) filling compound and consumption depending on edge type of boards (see also page 24)

Due to the number of alternatives the following criteria were assumed for the determination of the consumption:

D127: spacing of furring channels 333.3 mm, spacing of suspenders 1000 mm, spacing of carrying channels 900 mm
D124: spacing of furring channels 333.3 mm, 2nd grid level with Universal Bracket, fire protection from below and from above

| Item | Description | No. of units | Unit price | Total price |
|---|---|---|---|---|
| ..... | **Knauf Cleaneo Acoustic Design Ceiling D127**<br>Ceiling lining / suspended ceiling* DIN 18168-1,<br>installation height in m ....., suspension height in cm .....,*<br>sound absorption coefficient according to DIN EN ISO 11654 $\alpha_w$ = .....,*<br>anchored on reinforced concrete, spacing in cm ...../<br>steel girder, type ....., spacing in cm ....., *<br>installation with carrying channels and furring channels, suspended with Universal Bracket/ Nonius suspension *,<br>cladding made of perforated/ slotted * gypsum boards DIN 18180<br>Knauf Cleaneo Acoustic with air-cleaning effect, thickness 12.5 mm, installation DIN 18181, single layer,<br>*Standard Perforation:* Standard Circular R: 6/18 R/ 8/18 R/ 10/23 R/ 12/25 R/ 15/30 R */<br>Standard Square Q: 8/18 Q/ 12/25 Q */<br>*Alternating Perforation:* Alternating Circular R: 8/12/50 R/ 12/20/66 R */<br>Random PLUS R: 8/15/20 R/ 12/20/35 R */<br>*Block Perforation:* Standard Circular R: 8/18 R/ 12/25 R/ ..... *,<br>as Block Perforation: type B4/ B5/ B6 */<br>Standard Square Q: 12/25 Q/ ..... *,<br>as Block Perforation: type B4/ B5/ B6 */<br>*Block Slots:* „slotline“ as Block Slots: type B4/ B5/ B6 *,<br>lamination on back with Knauf Standard Fleece, color: white/ black/ ..... *,<br>joint treatment: filling with Knauf Uniflott / Fugenfuller*/ F2F*<br>insulation made of mineral wool according to DIN EN 13162, thickness 20 mm. *<br>Product/ System: **Knauf Cleaneo Acoustic Design Ceiling D127** ..... m² | ..... AED / QR / BHD | ..... AED / QR / BHD |
| ..... | **Knauf Cleaneo Acoustic Fire Protection Ceiling D124**<br>Ceiling lining / suspended ceiling DIN 18168-1,<br>installation height in m ....., suspension height in cm .....,*<br>fire resistance class according to DIN 4102-2 F30,*<br>for suspended ceiling solely resistant to fire from below for protecting the basic ceiling and the plenum, */<br>for suspended ceiling solely resistant to fire from the plenum and from below for protecting the room lying below, the basic ceiling and the plenum *,*<br>sound absorption coefficient according to DIN EN ISO 11654 $\alpha_w$ = .....,*<br>anchored on reinforced concrete spacing in cm ...../<br>steel girder, type ....., spacing in cm ....., *<br>installation of 1st grid level with carrying channels and furring channels,<br>suspended with Universal Bracket/ Nonius suspension *,<br>cladding made of Knauf Fire-Resistant Boards FR ,thickness 12.5 mm,<br>insulation applied above furring channels plus 15 cm wide insulation strip on carrying channels<br>made of mineral wool min. 40 mm, density ≥ 40 kg/m³, melting point ≥ 1000°C (1832°F),*<br>installation of 2nd grid level with furring channels only/ carrying channels and furring channels *,<br>suspended with Direct Bracket/ Universal Bracket * on furring channels of 1st grid level,<br>cavity damping with mineral wool,<br>min. 25 mm Rockwool Floorrock SE or equivalent */<br>min. 40 mm, density ≥ 40 kg/m³, melting point ≥ 1000°C (1832°F) *,<br>fill channels/ carrying channels * with mineral wool,<br>cladding made of perforated/ slotted * gypsum boards DIN 18180<br>Knauf Cleaneo Acoustic with air-cleaning effect, thickness 12.5 mm, installation DIN 18181, single layer,<br>with perforation Standard Circular R: 8/18 R/ 15/30 R */ Alternating Circular R: 12/20/66 R */<br>Standard Square Q: 12/25 Q */ Random PLUS R: 12/20/35 R */ ..... *,<br>lamination on back with Knauf Standard Fleece, color: white/ black/ ..... *,<br>joint treatment: filling with Uniflott / Fugenfuller*/ F2F*<br>Product/ System: **Knauf Cleaneo Acoustic Fire Protection Ceiling D124** ..... m² | ..... AED / QR / BHD | ..... AED / QR / BHD |

** Cancel not applicable items*

Sub-total ..... AED / QR / BHD

## Construction

**General**

- Knauf Cleaneo Acoustic Boards are lined with Knauf Standard Fleece (white or black), or special acoustical fleece on request. Other colors on request.
- The sound absorption diagrams of individual Knauf Cleaneo Acoustic Boards show values that are only valid in connection with Knauf Standard Fleece linings.
- Knauf Cleaneo Acoustic Boards are perforated or slotted gypsum boards based on gypsum and zeolite, ideal for rooms to improve room climate and reduce air pollution.
- Loads directly anchored to Knauf Cleaneo Acoustic Boards are not permissible.
- Random PLUS: Certain view points in a room or unfavorable lighting may lead to a diminished visual impression of a continuous perforation pattern caused by longitudinal joints.
- Depending on the direction of the light, a looming of the furring channels can occur in connection with white Knauf Standard Fleece and perforations with diameter ≥ 10 mm.
- Separate gypsum boards from building elements made with materials other than gypsum, especially columns, by creating control joints that allow for movement, e.g. shadow gap.
- Settlement joints have to be transfered into the construction of the ceiling System.
- Use control joints in the case of ceiling areas over approx. 15 m length, or for narrow ceiling spaces caused by a break of a wall. For strongly structured suspended ceilings, additional control joints may become necessary.
- Knauf profiles are delivered galvanized. This corrosion protective coating is sufficient for indoor rooms, including bathrooms and kitchens in residential housing.

**Knauf Cleaneo Acoustic Design Ceiling D127**

- Knauf Cleaneo Acoustic Ceilings are anchored directly to the basic ceiling as a ceiling lining, or with suspenders as suspended ceiling.
- Knauf Boards are attached to a metal grid of carrying channels and furring channels.
- Mineral wool mats with a minimal thickness of 20 mm can be placed on the furring channels.

**Knauf Cleaneo Acoustic**
**Fire Protection Ceiling D124**

- Knauf Cleaneo Acoustic Fire Protection Ceilings as suspended ceilings consist of fire protection level and acoustic level.
- Fire protection F30 solely from below, or alternatively solely from below and from above, is provided. The installation of Knauf access panels is possible.
- The fire protection level is anchored on the basic ceiling with Universal Brackets or Nonius suspension. Knauf Fire-Resistant Boards FR according to DIN 18180 / EN520 are screwed on a metal grid of carrying channels and furring channels CD 60x27 according to DIN 18182-1.
- The acoustical level is attached with Direct Brackets or Universal Brackets to the furring channels of the fire protection level.

Knauf Cleaneo Acoustic Boards are attached to a metal grid made of furring channels only or made of carrying channels and furring channels CD 60x27.

## Edge types

**Knauf Cleaneo Acoustic Boards**
**with continuous perforation**

Knauf Cleaneo Acoustic Boards with continuous perforation patterns are delivered with square 4 sides (4SK) edges, dimensions as shown in the lists, 2 to 3 mm smaller than specified.

**Knauf Cleaneo Acoustic Boards**
**with Block Perforation type B4/ B5/ B6**

Knauf Cleaneo Acoustic Boards with Block Perforation are available as 4-side square edge (4SK) type, and with perforations 12/25 R and 12/25 Q additionally with 4-side tapered edge (4AK) type.

**Knauf Cleaneo Acoustic Boards**
**with Block Slots "slotline" type B4/ B5/ B6**

Long edges: HRK (half-rounded edge), front edges: factory beveled (SFK), 4-side square edge (4SK) and 4-side tapered edge (4AK) on request.

**Knauf Cleaneo Acoustic Boards**
**with non-perforated perimeter**

- 1-side to 4-side non-perforated perimeter as specified
- cut 4-side square edge (4SK)
- 4-side non-perforated perimeter, with bevel (4FK)
- 1-side to 4-side with bevel (FK) at non-perforated perimeters
- 4-side non-perforated perimeter as specified and with 4-side tapered edge (4AK)

## Specifications for planning

- Perforation type: Standard Circular R/ Alternating Circular R/ Random PLUS R/ Standard Square Q/ Block Perforation/ Block Slots
- Separations (e.g. as exposed joints) within one room, especially when designing segments with continuous perforation.
- Fire resistance: F30 solely from below, F30 solely from below and from above.
- Color of fleece: white / black / other.
- Perimeter: non-perforated perimeters with width specifications according to page 4.
- Design of perimeter in room with/ without shadow gap, specified width.

# D12 Knauf Cleaneo Acoustic Ceilings

**Application, Jointing, Surface Treatment**

## Grid

**Knauf Cleaneo Acoustic Design Ceiling D127**
Suspended with Nonius Top, Universal Bracket, Nonius Hanger Bottom or Nonius Stirrup.

Reinforced concrete: Knauf Ceiling Steel Dowel
Other building materials: anchors have to be permitted and standardized for the building material being used.

Connect carrying channels CD 60x27 with hangers and align them at the required suspension height. Connect furring channels CD 60x27 to carrying channels with Intersection Connectors or Clips for CD 60x27; spacing depending on perforation pattern, 333.5 mm max.

**Cleaneo Acoustic Fire Protection Ceiling D124**
Fire protection level: Suspended with Universal Brackets or Nonius suspension spaced at 650 mm max. Spacing of carrying channels and furring channels according to tables on pages 2,3 and 21

For fire protection from above apply an additional layer of mineral wool, building material class A, density ≥ 40 kg/m$^3$, melting point ≥ 1000°C (1832°F), t ≥ 40 mm above furring channels and a min. 15 cm wide mineral wool strip on carrying channels.

Acoustic level: Suspended with Direct Bracket (single grid) or Universal Bracket (double grid). Max. load per suspension point: 100 N. Spacings of channels and suspenders according to tables on pages 2,3 and 21.

Apply mineral wool, building material class A, density ≥ 40 kg/m$^3$, melting point ≥ 1000°C (1832°F), t ≥ 40 mm for grid fastened with Universal Bracket or t ≥ 25 mm Rockwool for single grid fastened with Direct Bracket along the entire ceiling area.

- Single grid (only one level of parallel channels): fill channels with mineral wool strips and apply mineral wool fully between channels.
- Double grid (consisting of carrying channels and furring channels): fill carrying channels with mineral wool strips and apply mineral wool fully above furring channels.

## Cladding

**Knauf Cleaneo Acoustic Design Ceiling D127/ Cleaneo Acoustic Fire Protection Ceiling D124**
Cross-mounting of Knauf Cleaneo Acoustic Boards (joint width 2 to 4 mm, depending on perforation pattern) laterally to furring channels, place front edge joints on channels. Sand down the face side square edges (SK) slightly with Sanding Mesh before installing the boards.
Knauf Cleaneo Acoustic Boards with standard or alternating perforation are color-coded in red and blue along the edges. Place red marking adjacent to blue marking along front and long edges. An installation team with 3 workers is recommended.

Align Knauf Cleaneo Acoustic Boards using laser equipment or reference cord regarding continuous straight perforation rows beyond joints in diagonals and lateral as well as longitudinal direction.
Use Perforation Aligner with knobs compatible to perforation pattern to check correct joint width (this does not replace aligning). Start fastening of Knauf Cleaneo Acoustic Boards either in the middle or at a corner in order to prevent upsetting deformation. Press the boards firmly on to the grid during screw attachment. Fastening according to table on page 24.
A seamless, non-perforated frieze with a minimum width of 100 mm is recommended for irregular or non-rectangular layouts of ceilings.

## Jointing

Hand fill joints with Knauf Uniflott without using tape on 4SK boards. Use Fugenfüller / F2F and tape on 4AK boards. Cover all screw heads as well.
Knauf Cleaneo Acoustic Boards: prime before jointing.
Fill joints with Knauf Uniflott using the tube of the installation set, skim with Knauf F2F in a second run. Possibly filled perforations can be cleaned using a Pilot Wheel compatible to perforation pattern before hardening of filling compound.

Filling and covering of joints should only take place after the boards have been allowed to rest in the given humidity and temperature zones, and no more longitudinal changes can be expected, i.e. expansion or contraction. Joints should be filled at a minimum temperature of 10°C (50°F). In case of mastic asphalt screed, fill in joints after screed has been applied.

## Surface Treatment

Before applying paints or coats the fillled surface should be dust-free. Use a primer on Knauf Cleaneo Acoustic Boards before coating or painting them. Ensure that the primer and the coat or paint are compatible.
The following coats can be used on Knauf Cleaneo Acoustic Boards:

- Coats: Resin dispersion paints, multicolored (rainbow) emulsion, oil paint, matte-finish lacquer, alkyd resin paint, polymer resin paint, PUR lacquer, or epoxy-based lacquer, according to intended use or as required.
- Alkaline coats such as lime, water glass paints and silicate-based paints are unsuitable for gypsum board surfaces.
- Silicate-based emulsion paints may be used after referring to the manufacturer's recommendations and following the stipulated guidelines closely.

***Notes***
If Knauf Cleaneo Acoustic Boards are coated with diffusion open coats like dispersion paint, their air-cleaning effect will only be marginally reduced.

Gypsum board surfaces that have constantly been exposed to light without any protection can cause yellowing after coating. Therefore, a trial coat is recommended that will extend across several boards including all joints. Yellowing can, however, be successfully avoided only by using a special primer.

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